

Nebraska Energy Office Annual Report 1996



E • N • E • R • G • Y



STATE OF NEBRASKA



E. Benjamin Nelson
Governor

EXECUTIVE SUITE
P.O. Box 94848
Lincoln, Nebraska 68509-4848
Phone 402-471-2244
Fax 402-471-6031

February 15, 1997

Dear Nebraskans:

A continuing success story is the Energy Office's Dollar and Energy Saving Loan program. As of June 30, 1996, more than \$63.8 million have been loaned to Nebraskans for more than 11,000 energy efficiency projects. This loan fund was capitalized with \$17.68 million in oil overcharge funds. The loan fund and \$15.78 million in loan repayments have leveraged in excess of \$30.42 million from the state's private lenders.

Because these funds were given to the state to provide restitution to all Nebraskans injured by oil company pricing overcharges, it is only fitting that more than three-quarters of the loans made to date have been for energy efficiency improvements in the homes of Nebraskans. The balance of the loans have financed improvements on farms and ranches and in small businesses and local government and nonprofit buildings. The loans continue to stimulate economic activity and are responsible for creating the equivalent of 1,253 jobs in communities across the state.

In December, the Dollar and Energy Saving Loan program was selected as just one of three recipients of the U.S. Department of Energy's 1996 State Energy Program Award. Only state efforts "that consistently demonstrate program commitment and... make a significant impact" were selected for recognition.

Also noteworthy is the very premise on which the loan fund was established: preservation of capital. Nebraska, unlike many other states, placed a majority of the one-time oil overcharge money into revolving funds, so that the capital would continue to benefit as many Nebraskans as possible. Nearly 43 percent of the funds received by the state have been allocated for Dollar and Energy Saving Loans.

Nearly 15 years ago, the Energy Office pioneered in creating the nation's first oil overcharge funded loan program — the Electrical Load Management Resource Fund — detailed on page 8. To date, this model effort has saved Nebraska ratepayers nearly \$6 million from a \$50,000 investment. Only now, are other states adopting the revolving loan model on which these successful programs are based.

Details of these successes and other agency activities can be found in the Nebraska Energy Office's 1995-1996 *Annual Report*. It is with great pleasure that I present this *Report* to you.

Sincerely,

E. Benjamin Nelson
Governor

Table of Contents

Section	Page Number
Weatherization Division	
1995-1996 Highlights	1
Since 1979	1
Homes Weatherized in 1995-1996	1
Other Oil Overcharge Projects	2
Regional Training	2
Energy Financing Division	
School District Energy Efficiency Program	3
Institutional Conservation Program	4
Energy Projects Division	
State Energy Program	5
Oil Overcharge Funds	6
Energy Efficiency, Renewable Energy, Pollution Prevention and Other Energy Concerns	
Climate Wise	12
High Level Nuclear Waste Transportation and Storage	12
Hydropower Resources Assessment	12
National Energy Code Compliance on New Home Construction	12
Wind Resource Assessment	12
Ethanol and Other Alternate Fuels	
1995-1996 Highlights	14
Governors' Ethanol Coalition	15
Natural Gas Technical Assistance	
Municipal Natural Gas Regulation Act	16
Technical Assistance	16
Grants and Legislation	
Grants	17
Legislation	18
Fiscal and Organizational Notes	
Financial Review	19
Organization	20
Issues and Trends	
Introduction	21
Energy Costs and Consumption	21
The Top Story: Nebraska's Changing Transportation Picture	21
Electricity	24
Nuclear Power and Nuclear Waste	26
Natural Gas	29
Petroleum	30
Alternate Energy	33

Table of Figures

Figure Number	Page Number
1 Weatherization Funding Sources, 1979-1996	1
2 Number of Homes Weatherized by Sources of Funds, 1979-1996	1
3 Nebraska Weatherization Assistance Program Service Areas and Homes Weatherized, July 1, 1995 - June 30, 1996	2
4 School District Energy Efficiency Program and Institutional Conservation Program Loans, Grants and Studies by County, 1995-1996	3
5 Gasoline Equivalent Saved by State Energy Program Activities, 1985-1995	5
6 Nebraska Energy Settlement Fund	6
7 Oil Overcharge Contracts	7
8 Oil Overcharge Funds Invested in Types of Dollar & Energy Saving Loans	8
9 Cumulative Savings of Communities Borrowing Electrical Load Management Resource Funds, 1983-1996	8
10 Governors' Ethanol Coalition Member States	15
11 Areas Receiving or Appealing Natural Gas Rate Requests in 1995-1996	16
12 Where The Money Came From, 1988-1996	19
13 Where The Money Went, 1988-1996	19
14 Nebraska Energy Office Organization	20
15 Total Energy Expenditures, Nebraska, 1970-1995	21
16 Transportation Energy Expenditures Compared to All Energy Expenditures, Nebraska, 1970-1995	23
17 Motor Vehicle Miles Traveled in Nebraska, 1978-1995	24
18 Pauline Moore 345KV Transmission Route	26
19 Nebraska Nuclear Power Plant Locations by County, 1996	27
20 Proposed Nuclear High- and Low-Level Waste Storage Sites in U.S.	28
21 Nebraska Natural Gas Production by County, 1995	29
22 Crude Oil Production, Nebraska, 1939-1995	30
23 Nebraska Crude Oil Production by County, 1995	31
24 Average Annual Wind Speed in Miles-per-Hour, Nebraska, 1995	35

Weatherization Division

The Weatherization Division administers the Low Income Weatherization Assistance Program — a federally-funded program for weatherizing homes to save money and energy. The Energy Office is responsible for inspecting about 20 percent of the homes — about 276 — that are weatherized and for monitoring and auditing the subgrantees, primarily community action agencies, which actually make the home weatherization improvements.

Weatherization Funding Sources, 1979-1996

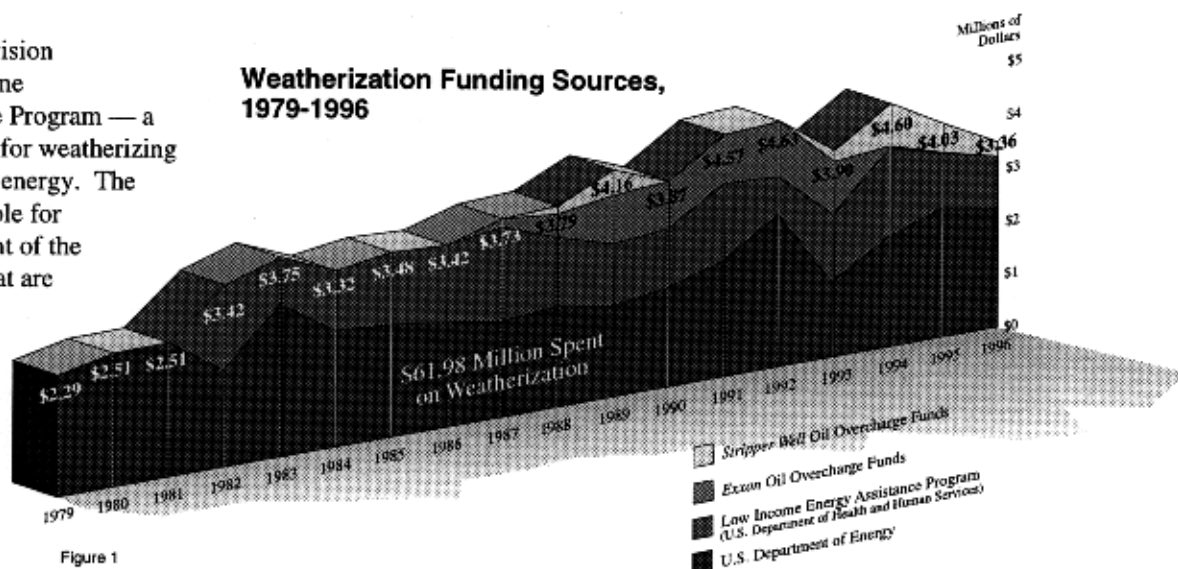


Figure 1

Source: Nebraska Energy Office

1995-1996 Highlights

In 1995-1996, total funding for the program was \$3,369,634. The Department of Energy's Low Income Weatherization Assistance Program provided a total of \$2,296,559 and the Low Income Home Energy Assistance Program, administered through the Nebraska Department of Social Services, supplied a total of \$1,038,974. The balance of the funding — \$34,101 — came from the *Stripper Well* oil overcharge trust account.

Total funding for this activity decreased nearly 12.5 percent from the previous year. Decreases in funding from the federal Department of Health and Human Services and oil overcharge trust funds were partially offset by a funding increase from the U.S. Department of Energy. The only overcharge funds remaining to be used by the Weatherization Assistance Program are *Stripper Well* monies. Figure 1 shows the funding amounts and sources since the program began in 1979.

Since 1979

Since the Low Income Weatherization Assistance Program began operation in the state in 1979, nearly \$62 million in federal and oil overcharge funds have been spent to weatherize the homes of low-income elderly, disabled and others.

In the past 16 years, 45,755 homes have received free weatherization (see figure 2). However, an estimated 62,000 Nebraska homes remain eligible for this service.

Number of Homes Weatherized by Sources of Funds, 1979-1996

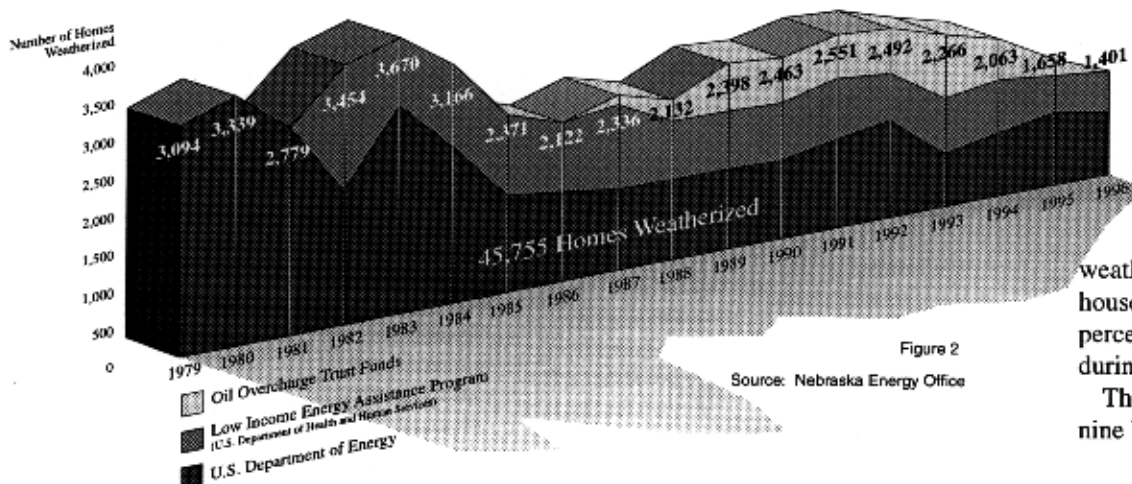


Figure 2

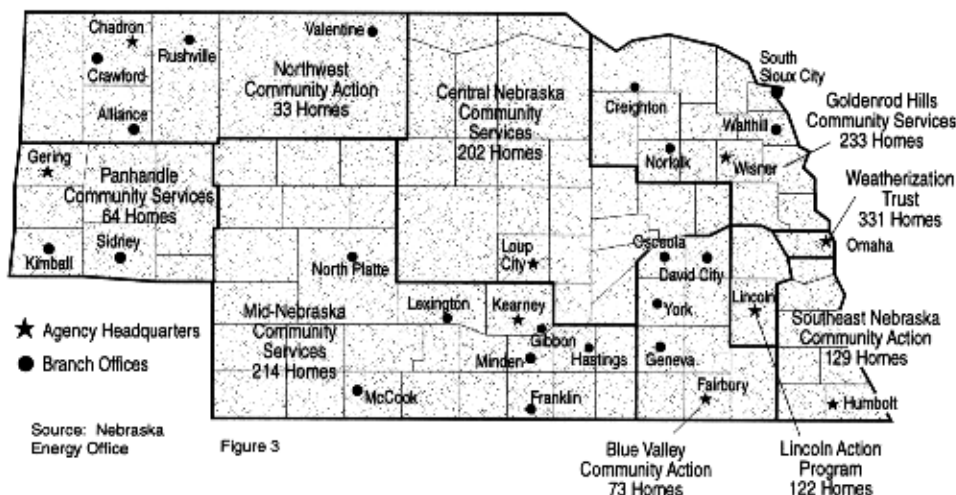
Source: Nebraska Energy Office

Homes Weatherized in 1995-1996

A total of 1,401 homes, were weatherized in fiscal year 1995-1996. In keeping with the agency's priority to serve Nebraska's elderly community through the Low Income Weatherization Assistance Program, the division weatherized 421 elderly households, or more than 30 percent of all homes improved during this period.

The map, figure 3, shows the nine Weatherization Assistance

**Nebraska Weatherization Assistance Program
Service Areas and Homes Weatherized,
July 1, 1995 - June 30, 1996**



Program service areas and the number of homes weatherized in each area from July 1, 1995, through June 30, 1996.

Home improvements made through the program saved Nebraskans a total of \$191,937 in avoided energy costs during 1995-1996. The home improvements represent a one-time investment that most likely will yield a rate of return for at least twenty years.

Other Oil Overcharge Projects

In late 1995, the agency converted the Weatherization Assistance Program Loans for landlords unable to pay one-half the cost of the improvements to Weatherization Energy Efficient Mortgages for soon-to-be home buyers.

These new mortgages are limited to those families with incomes ranging from \$11,610 for a family of one to \$39,120 for a family of eight. The below-market-rate mortgages allow prospective home buyers to make necessary energy-saving home improvements without raising the cost of the monthly mortgage payment.

Funds to capitalize the Weatherization Energy Efficiency Mortgages came from two sources: \$100,000 from funds for Weatherization Assistance Program Landlord Loans — \$50,000 from a 1991-1992 U.S. Department of Energy incentive grant and \$50,000 in Exxon oil overcharge funds — and \$58,823 from a one-time federal Department of Energy grant received in 1995-1996 that distributed previously uncommitted weatherization funds to the states.

Regional Training

In May 1995, more than 250 weatherization professionals from four Midwestern states gathered in Lincoln for a four-day training conference. This was the first time the conference had been held in Nebraska.

Conference participants learned how to improve aspects of the Low Income Weatherization Assistance Program at the local level.

The conference was financed with a U.S. Department of Energy grant of \$87,278. However, only \$50,289 was spent on conference activities. The remaining funds in the grant, \$36,989, were spent this reporting period on training opportunities for weatherization professionals in Iowa, Kansas, Missouri and Nebraska.

During the reporting period, the agency also received a \$10,000 grant from the regional office of the federal energy agency to provide technical training for weatherization professionals in the region. Since no regional training was provided during the period, these funds will be used in 1996-1997.

Energy Financing Division

The Energy Financing Division operates federal and state programs which finance energy improvements in homes, businesses, farms and ranches, nursing homes, government buildings, schools and hospitals:

- School District Energy Efficiency Program
- Institutional Conservation Program
- Dollar and Energy Saving Loan Program
- State Building Revolving Fund

A full report on the Dollar and Energy Saving Loan Program and State Building Revolving Fund is found on pages 7-8 and 10 respectively.

Collectively, these programs are designed to reduce the cost and use of energy in buildings and systems. During the time these programs have been in existence, Nebraskans have saved millions of dollars through more efficient use of energy resources.

School District Energy Efficiency Program

In 1981, the Nebraska Legislature created the forerunner to the School District Energy Efficiency Program — the first on-going state-supported program to weatherize kindergarten through twelfth grade public schools in the nation. For the first four years, only matching grants for energy conservation building improvements were given. In 1985, grants of up to \$2,500 per school for engineering studies were added. Beginning in 1986, the energy conservation improvements portion of the program was converted from grants to no-interest loans.

In 1993, the Legislature broadened the types of financing to include loans for energy studies, for the purchase or conversion of school vehicles to operate on alternate fuels and for installation of alternate fueling facilities.

For the first 11 years, state oil and natural gas severance taxes financed the program. From 1991 through 1996, the program was self-supporting, making loans from a revolving fund capitalized from loan repayments and interest earnings.

Through June 1996, more than \$32.8 million in grants and loans have been made to the state's public school systems to finance energy saving studies and building improvements.

Energy Office staff reviewed applications for grants and loans, conducted technical reviews of the planned improvements, monitored progress of the building modifications, collected loan repayments and analyzed energy consumption reports filed by the schools.

School District Energy Efficiency Program July 1, 1995-June 30, 1996

Energy Improvement Loans

Loans Issued

School	Number of Buildings	Amount
Beatrice Public Schools	5	\$342,916
Beemer Public Schools	1	28,350
Bellevue Public Schools	1	4,333
Blair Public Schools	2	467,886
Chambers Public Schools	1	5,745
Creston Public Schools	1	20,270
Elmwood-Murdock Public Schools	3	108,403
Elwood Public Schools	1	35,582
Ewing Public Schools	1	10,528
Filly Consolidated Schools	1	3,136
Grand Island Public Schools	7	267,820
Hebron Public Schools	4	153,699
Hyannis High School	1	203,440
Lexington Public Schools	1	88,018
Lincoln Public Schools	1	608,900
Mead Public Schools	1	115,008
Norris Public Schools	1	126,182
Omaha Public Schools	15	584,687
Papillon-LaVista Public Schools	4	136,424
Ralston Public Schools	7	317,732
Richland Public Schools	1	38,780
Totals	60	\$3,645,617

School District Energy Efficiency Program and Institutional Conservation Program Loans, Grants and Studies by County, 1995-1996

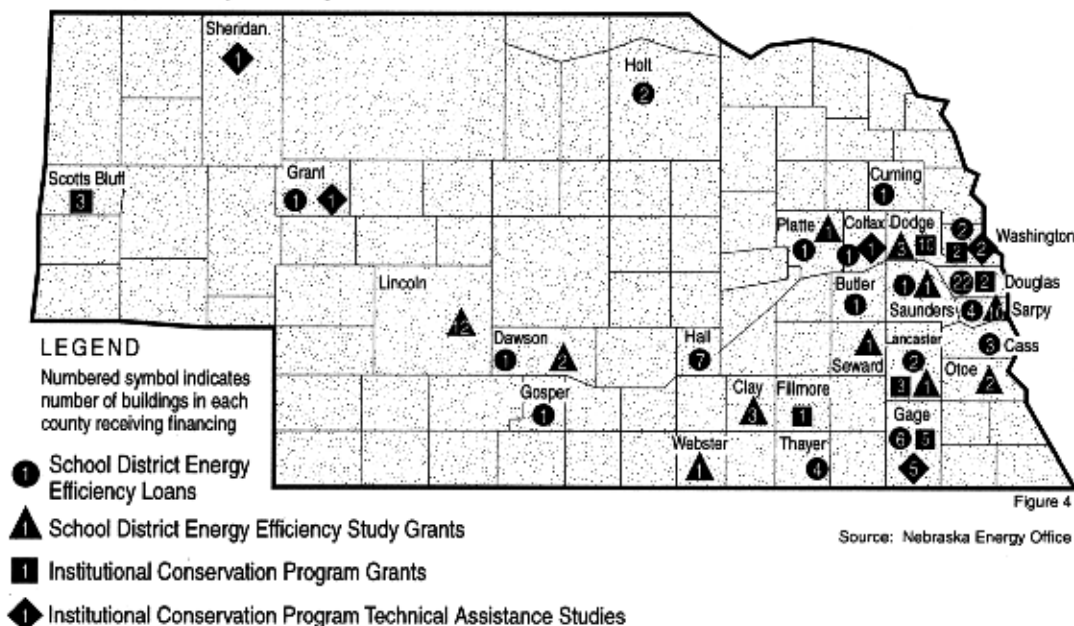


Figure 4

Source: Nebraska Energy Office

In May, 1995, the Legislature voted to create a technology fund for the state's schools. The fund will be financed with proceeds from the School District Energy Efficiency Program. Over the next 14 years, the agency will collect loan payments from the schools and transfer the funds to the Department of Education for issuing technology grants to the schools.

No-Interest Loans

From December 1986, through June 1996, more than \$14.9 million in no-interest loans have been made for 393 projects across the state.

The loan portion of the program was designed so that a school district repaid the loan with all or a portion of the energy dollar savings it received from completing the improvement.

At the end of the reporting period, June 30, 1996, the program's loan pool contained \$13.2 million. Currently, 155 school districts have 356 loans in repayment, totaling \$7.4 million. In 1995-1996, the agency approved loans for energy improvements for 60 buildings in 21 school districts amounting to \$3,645,816.

Projects funded through the loan program must have had an anticipated payback period of less than their expected life. The loan period could have been up to fourteen years. To date, 19 school districts paid off loans totaling \$715,796.

The table on page 3 lists the school districts receiving loan funds in this period.

Engineering Study Grants

The School District Energy Efficiency Program also provided grants up to \$2,500 per building to finance an engineering study and report on the building and its energy-using systems. A registered professional engineer or architect must have conducted the study, which identifies all potentially cost-effective conservation improvements, as well as energy-saving changes in operation and maintenance procedures.

During 1995-1996, the Energy Financing Division issued engineering study grants totaling \$90,350 to 10 school districts for studies in 37 buildings. The table at left lists grant-receiving schools and figure 4 on page 3 identifies the location of the schools receiving the grants.

information to applicants, reviews and ranks applications, submits project proposals to the U.S. Department of Energy for final review, monitors the progress of approved projects and collects energy use information after the project is completed.

More than \$10.1 million in federal funds have been awarded to the state's schools and hospitals since the program became operational in 1980.

Final Grants

In August and December 1995, the U.S. Department of Energy awarded \$266,267 — \$16,615 for engineering studies on 10 buildings and \$249,652 for energy conservation improvements in 26 buildings. The projects being funded are expected to cost \$472,718, but are expected to save \$88,369 yearly in avoided energy costs. The table below lists recipients of both engineering study and energy improvement grants.

In 1996, Congress did not appropriate any funds for program administration or grants to schools and hospitals.

However, the goals of the program were included as possible state level activities under the State Energy Program (see page 5 for more information on this program).

Energy Office staff will continue to provide assistance to former grant recipients as previously funded projects are completed.

School District Energy Efficiency Program

July 1, 1995-June 30, 1996

Engineering Study Grants

School	Number of Buildings	Amount
Bee Public Schools	1	\$ 2,500
Bellevue Public Schools	10	23,500
Fremont Public Schools	3	7,500
Lexington Public Schools	2	5,000
North Platte Public Schools	12	30,000
Palmira District OR1	3	7,500
Red Cloud Community Schools	1	2,500
School District 9, Platte County	1	1,850
Sutton Public Schools	3	7,500
Wahoo Public Schools	1	2,500
TOTAL — 10 School Districts	37 Buildings	\$90,350

With the conclusion of the program, 489 grants totaling \$1,109,924 have been awarded to public school systems in the state.

Institutional Conservation Program

The Institutional Conservation Program provides 50/50 federal matching grants to nonprofit hospitals and public and private schools, either for engineering studies to identify cost-effective, energy-saving building improvements or for making energy improvements in the buildings. The Energy Office provides program

Institutional Conservation Program Grants

July 1, 1995-June 30, 1996

Institution	Number of Buildings to be Studied	Number of Buildings to be Improved	Grant Amount
Beatrice Campus of Southeast Community College	5		\$8,892
Beatrice Public Schools		5	26,388
Clarkson's St. John Neumann Elementary School	1		1,253
Dana College	2	2	33,718
Fillmore County Hospital		1	16,500
Hyannis High School	1		2,250
Midland Lutheran College		10	63,125
Omaha Holy Name Parish		1	31,330
Omaha Our Lady Of Lourdes Elementary School		1	4,375
Rushville's Parkview Lodge	1		1,500
Scottsbluff Public Schools		3	10,510
University of Nebraska at Lincoln		3	66,415
TOTAL	10	26	\$266,267

Energy Projects Division

The Energy Projects Division is responsible for administering the federally-funded State Energy Program created under the *Energy Policy Conservation Act* of 1975. The program allows the state to use its discretion in providing energy conservation services, but the Energy Office must submit an annual plan to the U.S. Department of Energy for review and approval.

In general, agency staff operates the program directly. Occasionally, the agency may work closely with outside contractors hired to perform specific projects. The Division is also responsible for preparing annual energy saving reports, *Nebraska Energy Statistics*, the agency's *Annual Report*, the *Nebraska Energy Quarterly* and federal or court reports on oil overcharge programs.

During calendar year 1995, the federally-funded program produced annual energy savings of 6.972 trillion British thermal units, which is equivalent to nearly 56 million gallons of gasoline. Figure 5 shows estimated energy savings over the past 11 years as a result of specific projects.

State Energy Program

Since the inception of the State Energy Program, the federal government has granted funds on an 80/20 matching basis to the states. In 1995-1996, Nebraska received \$228,500 in federal funds which were matched with \$45,700 in state severance tax funds.

In 1995-1996, State Energy Program projects included:

- Federally-mandated projects

- Oil overcharge project management
- Energy shortage management and emergency preparedness
- Energy policy implementation
- Education and information

Federally-Mandated Projects

According to the *Energy Policy Conservation Act*, the Energy Office must undertake mandatory projects in the specific areas of procurement, transportation, lighting standards, thermal standards and right-turn-on-red. The agency submits plans to the federal government for its review and approval of projected activities in these areas:

- The Energy Office coordinates and publishes a rideshare roster for state employees seeking to carpool. Nearly 100 state workers are listed on the roster from communities surrounding Lincoln.
- Nebraska satisfied the right-turn-on-red mandatory in 1973 when the Legislature passed both right-turn-on-red and left-turn-on-red legislation.
- Nebraska satisfied the minimum mandatory requirements in 1980 when the Legislature passed thermal efficiency standards, lighting efficiency standards and procurement procedures for state government.

Oil Overcharge Project Management

Exxon oil overcharge projects are managed as State Energy Program projects (see pages 6-11 for a full description of projects financed by oil overcharge funds).

Energy Shortage Management and Emergency Preparedness

As part of the agency's energy shortage and emergency activities, the Energy Office routinely monitors supplies and potential disruptions. Minor fuel outages are expected

Gasoline Equivalent Saved by State Energy Program Activities, 1985-1995 (Millions of Gallons)

Project Type	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Agricultural Energy Management	0.496	0.744	0.992	1.240	1.240	1.400	1.400	1.400	1.400	1.400	1.400
Dollar and Energy Saving Loan Program	0	0	0	0	0	0.201	1.299	2.241	2.686	3.208	4.021
Hundred Points of Light	0	0	0	0	0	0	0	0.247	0.345	0.350	0.355
Municipal Loan Programs	0	0	0	0	0	0.011	0.018	0.039	0.072	0.099	0.103
Nebraska Community Energy Management Program	0.248	0.336	0.384	0.384	0.392	0.392	0.392	0.388	0.388	0.389	0.389
Omaha Traffic Program	0	0	0	0	1.803	1.803	1.803	1.803	1.803	1.803	1.803
Public Buildings (including Green Lights)	0	0	0	0	0	0.003	0.083	0.083	0.083	0.083	0.179
Ride Share	0	0	0	0	0	0	0	0.032	0.049	0.048	0.040
Thermal Lighting Standards	11.072	14.904	18.768	22.368	26.080	30.144	33.304	36.840	40.544	44.664	48.592
Total Gallons of Gasoline Saved (in millions)	11.816	15.984	20.144	23.992	29.515	33.954	38.299	43.073	47.370	52.044	56.882

Source: Nebraska Energy Office

Figure 5

during planting and harvesting times. Monitoring is more intense during times when seasonal demands are high because of sudden weather changes. Contingency plans developed in prior years provide the structure for any necessary energy emergency activities.

During the reporting period, a January 1996 winter storm with 70 mile per hour winds, blowing and drifting snow, ice and bitterly cold wind chills caused power outages in more than 40 Nebraska towns. The State Patrol and National Guard provided assistance to motorists on the road and residents in homes without heat and electricity.

Energy Policy Implementation

In 1992, the Energy Policy Council forwarded to the Governor the *Nebraska Energy Policy Plan: Recommendations to the Governor* for his consideration.

By the end of that year, the Governor announced the first energy policy plan for the state — *An Energy Action Plan for Nebraska*. The *Action Plan* served as the first step in an on-going process to plan and implement effective programs to advance conservation and efficient use of traditional, nonrenewable energy sources, encourage the development of alternate and renewable energy sources and further energy-related economic development.

During the past three and a-half years, the Energy Office has undertaken the *Action Plan's* 20 objectives.

Education and Information Services

Education is needed by consumers to make sound energy decisions. The Energy Office identified and delivered educational opportunities and information resources through a coordinated statewide effort.

The agency published and distributed the *Nebraska Energy Quarterly* to thousands of Nebraskans. The *Quarterly* highlights a variety of energy conservation projects and topics. Two mandated agency publications, the *Annual Report* and *Nebraska Energy Statistics*, were also produced.

In 1993, the Energy Office established an Energy Education and Information Center as a means to centralize, organize and disseminate education and information resources to the general public. Since 1994, the Center's statewide energy education activities have been operated by the Nebraska Math and Science Initiative. The agency has actively promoted the use of national information services developed by the U.S. Department of Energy and others on Internet.

Oil Overcharge Funds

Since 1982, Nebraska has been receiving oil overcharge funds (sometimes referred to as Petroleum Violation Escrow Funds) as a result of various court actions against oil companies that overcharged their customers during the period of federal price controls from 1973 to 1981. Since direct compensation to injured consumers seemed unrealistic, the courts ordered that the money recovered from lawsuits be distributed to the states to fund programs that provide indirect restitution to injured energy consumers. States were directed to use the money, within parameters established by the courts, to fund energy assistance and conservation programs.

Nebraska Energy Settlement Fund A Summary of Exxon, Stripper Well and Diamond Shamrock Oil Overcharge Funds as of June 30, 1996

	Exxon	Stripper Well	Diamond Shamrock	Total
Total Received	\$15,504,944	\$14,585,204	\$359,172	\$30,449,320
Interest Earned	8,183,126	4,823,904	200,248	13,207,278
Total	\$23,688,070	\$19,409,108	\$559,420	\$43,656,598
Funds Budgeted				
Contracts	\$4,022,370	\$6,837,000	\$0	\$10,859,370
Program Development	103,692	0	6,434	110,126
Monitoring/Evaluation	375,112	0	0	375,112
Education	376,848	0	0	376,848
Load Management	50,039	0	0	50,039
Attorney General Legal Fees	0	299,327	0	299,327
Bank Wire Fees	0	98	0	98
Low Income Weatherization	4,019,737	3,259,484	0	7,279,221
Emergency Preparedness	45,907	0	0	45,907
Dollar & Energy Saving Loan Program	12,634,919	6,155,081	0	18,790,000
Loan Program Delivery	893,010	0	0	893,010
Special Projects	277,558	0	0	277,558
Designated Interest	615,615	1,375,013	0	1,990,628
Oil Overcharge Administration	0	384,199	543,800	927,999
Direct Restitution Project	0	0	9,186	9,186
Governor's Overcharge Plan '90	100,000	0	0	100,000
Uncommitted Balance	\$173,263	\$1,098,906	\$0	\$1,272,169
Allocated to Low Income Programs	\$0	\$278,534	\$0	\$278,534

Source: Nebraska Energy Office

Figure 6

Oil Overcharge Contracts

Exxon

Category	Allocated Funds	Contracts Issued	Expenditures Through June 30, 1996
Energy Education	\$1,573,490	\$1,196,642	\$928,440
Financing Demonstrations	916,959	916,959	913,537
Agriculture	291,276	291,276	291,276
Feasibility Studies	187,993	187,993	187,993
Building Improvement Demonstration	729,499	729,499	729,499
Transportation	700,000	700,000	700,000
Load Management	50,039	50,039	50,039
Dollar and Energy Saving Loan Program	12,634,919	12,319,658	12,319,658
Low Income Weatherization	4,019,738	4,014,500	4,014,500
Total Exxon Contracts June 30, 1996	\$21,103,913	\$20,406,566	\$20,134,942

Stripper Well

Category	Allocated Funds	Contracts Issued	Expenditures Through June 30, 1996
Low Income Weatherization	\$3,259,484	\$2,259,584	\$2,226,999
State Buildings Energy Team	810,000	124,210	124,210
Local Government			
Energy Management Circuit Rider	400,000	400,000	352,564
Public Transportation	800,000	800,000	790,540
Energy Related Biotechnology, Solar and Conservation Outreach	2,000,000	2,000,000	1,809,768
Greenhouse Project	400,000	400,000	400,000
Innovative Energy Grants	100,000	75,000	19,070
Dollar and Energy Saving Loan Program	6,155,081	4,444,275	4,444,275
Indian Tribal Governments	77,000	77,000	68,472
University of Nebraska Building Weatherization	500,000	500,000	497,136
Nebraska State College System	1,500,000	1,500,000	1,494,959
Curtis Weatherization	250,000	250,000	231,861
Total Stripper Well Contracts June 30, 1996	\$16,251,565	\$12,830,069	\$12,459,854

Source: Nebraska Energy Office

Figure 7

The agency's three programmatic divisions — Energy Financing, Energy Projects and Weatherization — manage projects financed by oil overcharge funds.

The Nebraska Energy Settlement Fund

The Nebraska Energy Settlement Fund was established by the Legislature for money paid to Nebraska from overcharge cases since March of 1986. Total funds (including interest) received as of June 30,

1996, were \$43.66 million: \$23.69 million in Exxon funds, \$19.41 million in Stripper Well funds and \$.56 million in Diamond Shamrock funds (see figures 6 and 7 for specifics on how the funds have been used).

Activity this year for each oil overcharge project financed by the Nebraska Energy Settlement Fund, reviewed by the Legislature and approved by the U.S. Department of Energy is described on this page and those that follow in this section.

Dollar and Energy Saving Loan Program
Exxon funds totaling \$12.63 million plus \$6.16 million in Stripper Well, \$.13 million in Amoco, \$.07 million in Coline, \$.73 million in National Helium and \$.16 million in Vickers funds (amounts include interest earnings) have capitalized the Dollar and Energy Saving Loan Program, which provides low-interest loans to Nebraskans to finance home, building, transportation and system improvements. More than 320 participating lenders provide six percent interest rate financing for up to fifteen years on loans for energy saving improvements.

The most common improvements in homes, apartments and small businesses are replacing furnaces, air conditioners and windows.

Popular agricultural improvements include installing low-pressure irrigation systems, replacing irrigation pumps and motors, making well modifications and replacing grain dryers. City and county

Oil Overcharge Funds Invested in Types of Dollar & Energy Saving Loans as of June 30, 1996

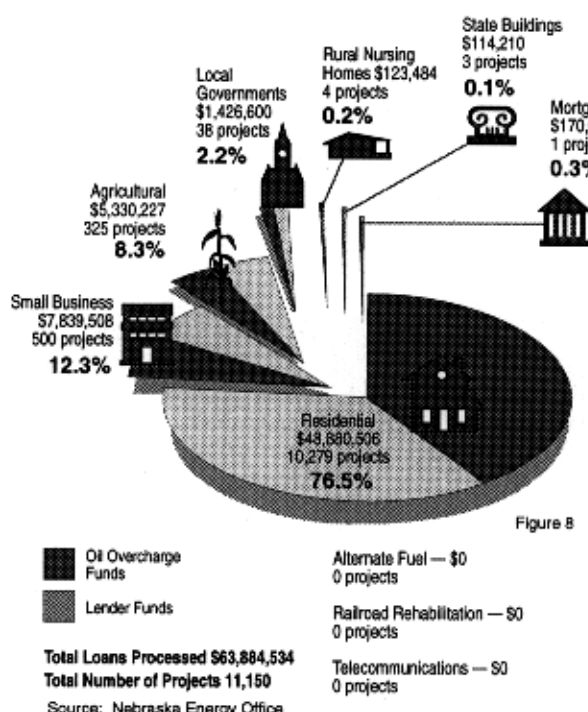


Figure 8

Since the loan program began more than five years ago, 11,150 project loans have been made. More than \$33.46 million in oil overcharge funds (\$17.68 million, including interest, plus loan repayments) have leveraged in excess of \$30.42 million from the state's private lenders. A total of more than \$65.5 million in low interest loans have been used to finance energy saving projects (see figure 8).

Electrical Load Management Resource Fund

Created in 1983, the Electrical Load Management Resource Fund is capitalized with \$50,000 in Exxon oil overcharge funds. Under contract, NMPP Energy manages the loan applications and repayments.

The fund offers interest-free financing to the 90-plus Nebraska utility members of NMPP Energy to help purchase, install or upgrade load management systems. These systems allow utilities to monitor and reduce peak demand, save energy and avoid being charged for expensive electricity used during peak times.

Over the 14 years of operation, the initial capital investment of \$50,000 has revolved more than nine times, saving ratepayers in the participating towns more than \$5.9 million (see figure 9). Communities that install load management systems continue to earn additional savings during the lifetime of the equipment.

In 1995-1996, two new loans were made:

- Arnold, \$12,000
- Callaway, \$12,000

Green Lights

Fifty thousand dollars in Exxon funds (unspent monies from Hundred Points of Light) and \$150,000 in Stripper Well funds (from the State Buildings Energy Team which never became operational) were allotted to create a state-level Green Lights effort.

An additional fifty thousand dollars in Exxon funds were added to the Green Lights effort in 1994-1995. These previously-approved funds were transferred from the Oil Overcharge Special Projects fund.

Green Lights is a national U.S. Environmental Protection Agency effort focused on using state-of-the-art lighting technologies in commercial and governmental buildings to reduce energy, costs and pollution.

For the past four years, university architecture and engineering students have been conducting lighting surveys of the state's 2,760 buildings, identifying what lighting improvements would be most cost-effective.

Based on earlier findings, it is estimated the state could save more than \$2.1 million annually from electricity and maintenance costs after the cost-effective lighting changes are made.

During this reporting period, funds totaling \$352,039 remaining in Green Lights and Hundred Points of Light were combined and reallocated to the Dollar and Energy Saving Loan Fund.

Hundred Points of Light

A quarter of a million dollars in Exxon funds was budgeted for subsidizing the replacement of incandescent bulbs with compact fluorescent lamps. Compact fluorescent bulbs require only one-quarter of the energy to produce an equivalent amount of light. They are more expensive, but last up to ten times longer, often paying for themselves in one or two years.

Cumulative Savings of Communities Borrowing Electrical Load Management Resource Funds, 1983-1996

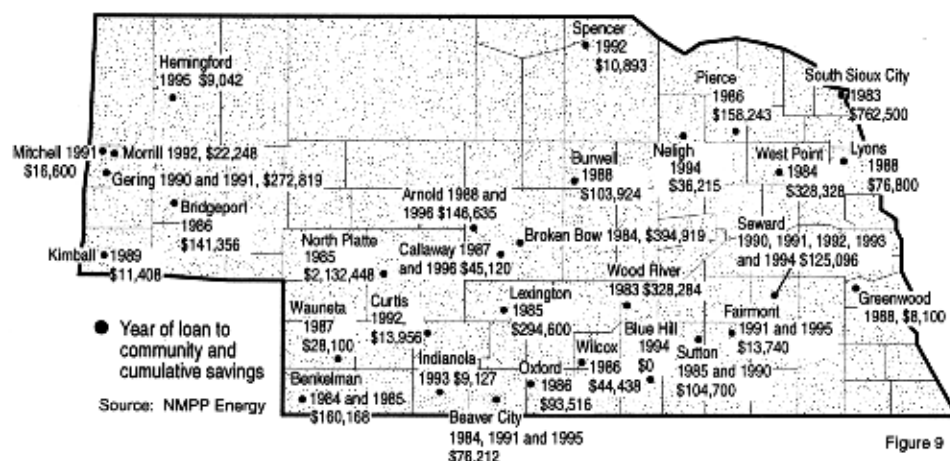


Figure 9

Total Estimated Savings to Date \$5,969,535

In 1992 and 1993, the state's two largest electric providers — Nebraska and Omaha Public Power Districts — cooperated with the Energy Office to subsidize placement of 28,000 compact fluorescents bulbs in over 860 commercial businesses. The five dollar subsidy was equally shared by the agency and the utilities. The Energy Office spent \$83,014 on this completed project.

In an earlier reporting period, Lincoln Electric System completed a \$20,000 effort to demonstrate lighting efficiency technologies in local businesses. After a year's use, the utility will report on energy and cost savings as well as owner satisfaction. The Energy Office has spent \$4,211 on this project.

Fifty thousand dollars was also allocated to the Green Lights program. For more information on this activity, see page 8.

Innovative Energy Grants

Stripper Well funds totaling \$100,000 were available for grants to individuals for research and/or development of energy-related inventions.

In this program's seven years, 33 preapplications have been received. Of those, 11 have been invited to complete the full application. Six of the 11 were reviewed by the University of Nebraska for technical feasibility. The Energy Office, along with the University's Technical Assistance Center, developed evaluation criteria for project review. Research continued on these previously selected projects:

- A \$50,000 grant was awarded to Grain Systems of Elm Creek in 1993 to complete the design and fabrication of a prototype grain dryer which utilizes a heat pump to dehumidify drying air which circulates in a closed loop.
- A \$25,000 grant was awarded in 1994 to S-Arrow of Hastings to demonstrate a catalyst-enhanced pyrolysis process using waste tires. The process is expected to produce a

fuel gas with higher energy content than that produced by typical pyrolysis.

Work on both these projects is scheduled for completion by the end of 1996.

Landlord Loan Program

This program, a component of the Dollar and Energy Saving Loan Program, was financed with \$50,000 in *Exxon* funds and \$50,000 from a 1991 U.S. Department of Energy incentive grant.

Since this program is operated by the Weatherization Division in the agency, a more complete report on this program appears on page 2.

Lincoln Energy Conservation Interest Subsidy and Rebate Program

This local subsidy and rebate program ended in 1991. Since some loans were retired earlier than planned, not all subsidies were fully utilized by the borrowers. Unused subsidies are returned to the Energy Office and totaled \$2,813 in 1995-1996.

Low-Income Weatherization Assistance Program

A total of \$7.28 million in oil overcharge funds (\$4.02 million from *Exxon* and \$3.26 million from *Stripper Well*) have been allocated to the Low-Income Weatherization Assistance Program to assist low-income Nebraskans with residential weatherization to reduce energy use and costs. In 1995-1996, \$50 in *Exxon* and \$34,101 in *Stripper Well* funds were spent through the program.

The terms of the *Stripper Well* court order mandate that an equitable share of the funds be set aside for the state's low-income population. To date, \$2,226,999 in *Stripper Well* funds have been spent.

For more detailed information about the Low-Income Weatherization Assistance Program, see pages 1 and 2.

Native American Tribal Governments

The *Stripper Well* court order requires the state to provide an equitable share of oil overcharge funds to Native American tribal governments. Based on the number of Native Americans in the state, \$77,000 have been set aside for eligible projects suggested by the tribal governments.

No projects were undertaken in 1995-1996. A total of \$8,528 remains for Native American projects.

Nebraska OnLine Support

The state's information and communication system, Nebraska OnLine, received \$60,000 in *Exxon* funds to partially defray long-distance telephone charges. The information system is operated by the Nebraska Library Commission.

During this reporting period, a total of \$17,136 was spent on long-distance charges and this project was concluded.

Nebraska State College System

A total of \$1.5 million in *Stripper Well* funds was allocated for energy conservation projects at the state colleges. To date, the college systems' Board of Trustees has designated funding for three projects: \$986,777 for construction of a wood-fired boiler at Chadron State College which was completed in 1992, \$45,000 for development of a comprehensive utilities plan for Peru State College and \$468,223 for building weatherization at any of the three campuses.

During 1994-1996, an additional ten building improvement projects were selected and completed.

Of the \$1.5 million, \$1,494,959 have been spent. The State College System also provided \$18,000 in matching funds to conclude this project.

Planning, Monitoring and Evaluating Oil Overcharge Programs

To comply with federal and court reporting regulations, \$384,199 in *Stripper Well* and \$450,000 in *Exxon* funds have been committed for planning, monitoring and evaluating programs funded with oil overcharge dollars. In 1995-1996, a total of \$21,794 (\$2,665

in *Stripper Well* and \$19,129 in *Exxon* funds) were spent. Also during this period, \$28,803 in *Exxon* funds from unexpended funds from previously approved projects were added to this activity.

Schuyler Energy Conservation Loan Program

Schuyler city government and its Energy Commission continued to operate a low interest energy conservation loan program for homes, businesses, nonprofits and governmental buildings.

The loan pool was capitalized with \$178,007 in *Exxon* funds and \$199,500 from local lenders.

To date, ten commercial loans totaling \$148,272 and 124 residential loans totaling \$341,003 have been made. The program is scheduled to operate through 1997.

Funds expended to date for program operations total \$63,656. The city has provided \$56,386 as in-kind match.

In 1994, Schuyler teamed \$25,000 in local keno revenues with \$50,000 from two local lenders to match \$75,000 in *Exxon* oil overcharge challenge loan funds from the Energy Office. This \$150,000 in no-interest funds leverages an equal amount from local lenders. The city then makes four percent energy conservation loans to local residents and businesses under the Dollar and Energy Saving Loan Program.

South Sioux City Energy Conservation Loan Program

The South Sioux City Area Chamber of Commerce completed its low-interest energy conservation loan program for commercial buildings during 1992-1993.

The loan pool was capitalized with \$132,000 in *Exxon* funds and \$66,000 from local lenders. An additional \$6,664 in *Exxon* funds was allocated for program operations. Nine projects were completed, using loan funds totaling \$77,332. Operating expenses totaled \$1,203. The local Chamber of Commerce provided \$2,200 as in-kind match. All loan repayments were completed in 1995-1996 and this project was concluded.

State Building Revolving Fund

Four hundred thousand dollars in *Stripper Well* funds were added to other funds — \$150,000 in *Stripper Well* funds from the state's Green Lights program and \$250,000 in *Stripper Well* funds from the Innovative Grants Program — to create a State Building Revolving Fund to partially finance lighting improvements identified in lighting surveys performed in state buildings.

The incremental cost of more energy efficient lighting improvements would be financed from two sources: a loan for one-half of the cost would come from the State Building Revolving Fund and one-half would be provided by the agency owning the building. However, some state buildings are eligible for grants from the state's Task Force for Building Renewal. These grants could be used for one-half of the agency's share of the cost of the improvements.

During 1995-1996, no loans were made from this fund. Subsequent reports on this fund will appear in the section on Dollar and Energy Saving Loans.

Statewide Energy Education

Two hundred thousand dollars in *Exxon* funds have been dedicated to coordinate statewide energy conservation instruction in grades kindergarten through twelve. Entities involved in the effort include educational service units, educator professional organizations, the state's Department of Education and energy suppliers. The goal is to increase energy awareness and promote energy efficiency to future consumers.

In 1994-1995, a contractor assisted agency staff coordinate work on energy education activities. To date, \$26,708 has been spent for educational contractors and staff support.

Starting in 1993, the Energy Office joined with the Nebraska Math and Science Initiative to further energy education in the state. The Initiative is a group of educators across the state and staff from the University of Nebraska-Lincoln working to improve science and math education.

In 1994, the Energy Office committed \$500,000 in *Exxon* oil overcharge funds to match a \$4.9 million grant — a total of \$10 million from the National Science

Foundation — to achieve excellence in elementary and secondary math and science education. Since this project began, more than 1,500 teachers have attended energy education workshops and 113 grants totaling \$153,025 have been awarded for specific energy projects in schools across the state.

During the reporting period, \$55,000 was spent for teacher training and grants.

The Initiative continues to operate the agency's energy education resource library and maximize use of the Internet for locating and distributing energy education resources.

Stuart Energy Conservation Loan Program

While this local commercial loan program ceased making new loans in 1991, repayments from the borrowers will continue beyond the beginning of the next century. The portion of the loan funds being repaid to the Energy Office will continue to accrue in the project's account until all loans have been repaid.

University of Nebraska Energy-Related Research

The University of Nebraska received \$2 million in *Stripper Well* funds to further energy-related research. Projects selected must secure matching funds before qualifying for oil overcharge dollars.

Of twelve research projects, 11 are completed. The continuing project is headed by Dr. David Jones, of the University of Nebraska-Lincoln Department of Biological Systems Engineering. The \$170,000 project seeks to develop a binder using waste fluids from ethanol production. The binder is mixed with waste paper to produce fuel pellets. The match requirement of \$170,000 was met by a Nebraska research pioneer who donated both money and equipment. The project is scheduled for completion in 1996.

Since the research projects began, \$1,809,768 in oil overcharge funds have been spent. This project is scheduled for completion in the next reporting period.

Other Energy Settlement Funds

Not all oil overcharge funds are part of the Nebraska Energy Settlement Fund. Some of these funds have been held in escrow by the U.S. Department of Energy and are distributed only when a plan is submitted by a state energy agency and approved by the federal energy agency's Office of Hearings and Appeals.

Oil overcharge settlement funds resulting from fines levied against *Amoco*, *Palo Pinto*, *Vickers* and other oil companies fall into this category.

According to the Department of Energy, all future settlement funds received by the state will be classified as *Stripper Well* funds and not subject to review by the Office of Hearings and Appeals.

Specific Oil Overcharge Projects

The status of each oil overcharge project financed with these miscellaneous funds is described on this page.

BERT Loan Program in Omaha

Omaha's Benson neighborhood was one of the last participants in the agency's community energy management program which ended in 1987. As a result of that program, the Benson Energy Resource Team — BERT — was formed and launched a revolving loan program to help homeowners and businesses finance energy saving improvements. The loan program was capitalized with \$90,000 in *Amoco* oil overcharge funds and ended in June, 1993. The last loan was repaid in June 1996.

Statewide Energy Information Service

In 1992-1993, the Energy Office began to develop energy information services to assist consumers to make decisions resulting in the efficient and economic use of energy.

Funded with \$150,000 in *Amoco* funds, the agency began the process to develop and maintain a library collection. Displays on a variety of topics were developed or borrowed from other organizations. Informational materials were developed and distributed on energy topics at a variety of events. Since 1992, \$101,837 have been spent on energy information services.

Energy Efficiency, Renewable Energy, Pollution Prevention and Other Energy Concerns

As the agency adapts to an ever-changing world of energy use and production, so the services and work performed by the Energy Office also change. During 1995-1996, the agency worked and funded, directly or indirectly, new activities that involved energy efficiency, renewable energy and pollution prevention as well as the historical activities for which it is known.

During the reporting period, the agency also applied to the federal government and others for discretionary funding for activities in new, but related, areas.

Climate Wise

In 1994-1995, the Energy Office was selected by the U.S. Department of Energy as one of seven states to receive a \$50,000 Climate Wise grant. This federal voluntary program links the federal and state governments with industry to increase energy efficiency and reduce or prevent pollution.

During this reporting period, the activities included making Climate Wise partners eligible for low-interest Dollar and Energy Saving Loans and teaming with Industrial Assessment Centers in Kansas, Colorado, South Dakota and Iowa to perform energy and system analyses for nine manufacturers in the state.

By June 30, 1996, the agency led the nation with 15 Nebraska Climate Wise partners. The goal is to have 50 industries in the state participating in Climate Wise by mid-1997.

High-Level Nuclear Waste Transportation and Storage

The majority of nuclear waste in Nebraska is produced by the two nuclear power stations in Brownville and Fort Calhoun. For storage purposes, radioactive waste material is classified as high- or low-level waste depending on the length of time the waste remains radioactive.

High-level waste is spent nuclear fuel and has primarily been stored on site at nuclear power plants awaiting construction of a temporary or permanent repository.

Once a temporary or permanent storage site becomes available, transporting the high-level waste will begin. Because many nuclear facilities are east of Nebraska and likely storage areas are west of the state, rail lines and highways in Nebraska are probable corridors for shipments of high-level radioactive waste.

One nuclear group estimated that 15,000 truck or rail shipments would be needed over the next 30 years to move the waste from generators to storage sites. As many as 12,000 shipments could pass through Nebraska.

The Energy Office became involved in two issues related to the transportation and storage of spent nuclear fuel during the current reporting period:

- Nebraska joined nearly 20 other states and several utilities in filing a lawsuit against the U.S. Department of Energy when the federal agency announced that it had no obligation to begin accepting nuclear waste until a storage facility was constructed. In mid-1996, the Court of Appeals for the District of Columbia agreed with the states, ruling that the federal energy department must begin accepting nuclear shipments in 1998.
- As early as 1998, Nebraska could have a ten to 40-fold increase in the number of nuclear waste shipments passing through the state — from only ten in 1995 to 400 a year for the next 30 years. The Energy Office joined with Emergency Management, the State Patrol and the Department of Health to examine the state's readiness for a dramatic increase in the number of shipments of spent nuclear fuel across the state.

Hydropower Resources Assessment

In 1996, the Idaho National Engineering Laboratory completed a statistical assessment of current and potential hydropower resources in all states. The assessment projected the maximum amount of energy that could be produced if the site were developed.

The Energy Office was then asked to evaluate their assessment of the sites based on 20 factors such as recreational use, historic value and presence of endangered species. The state's Game and Parks Commission is assisting the agency in completing the evaluation. Upon completion, the Energy Office will receive a \$2,500 grant as compensation.

National Energy Code Compliance on New Home Construction

The agency was requested by the Nebraska office of the U.S. Department of Housing and Urban Development to review house plans of Nebraskans financing the purchase of their home with a Veterans' Administration, Farmers' Home Administration or Federal Home Administration mortgage. To be eligible for the government-backed mortgages, the homes must meet or exceed the 1993 Model Energy Code.

In 1995-1996, the agency evaluated an estimated 16 homes for compliance with the energy code. The agency charges \$50 for each review.

Wind Resource Assessment

In mid-1994, the Nebraska Power Association and other renewable energy interests including the Energy Office

agreed to participate in a multi-year study of the eight wind sites in the state for their energy producing potential.

On behalf of the Power Association, the agency applied to the Utility Wind Interest Group for a grant to partially fund the Nebraska wind study. In late 1995, the Power Association received a \$59,600 grant from the Interest Group.

In early 1996, the Energy Office received another grant in support of the Nebraska wind project. The National

Renewable Energy Laboratory awarded a \$74,428 grant to also partially fund the project. A \$10,000 grant from the American Public Power Association was also received in support of the project. The state's major utilities are supplying the remainder of the cost of the study. The wind assessment, which concludes in 1999, is expected to cost more than \$300,000.

The first year's assessment found that wind speeds ranged from 14.6 to 16.8 miles per hour and generally were strongest in February and October and in the early afternoon. Valentine and Springview had the highest speeds at 16.8 and 16.7 miles per hour, respectively. The lowest wind speeds were recorded at Rushville and Wahoo, 14.6 and 14.8 miles per hour, respectively.

Ethanol and Other Alternate Fuels

Historically, the role of the Energy Office in the development of alternate transportation fuels has been that of advocate and demonstrator. The Governor requested the agency, in its role of energy policy advisor, to take a more active role in coordinating the development and use of ethanol-based fuels, not only in the state, but around the country as well. In the past several years, the agency has been very successful in securing favorable policy treatment for ethanol and in locating funding for state, municipal and county transportation systems using alternate fuels.

1995-1996 Highlights

A number of issues and activities involved the agency as it fulfilled its role in fostering the growth of alternate transportation fuels, including ethanol.

America's Quest for Cleaner Transportation Fuels

With the passage of the amendments to the *Clean Air Act* in 1990 and the subsequent passage of the *Energy Policy Act* in 1992, cleaner burning fuels of all types became a national priority. Generally, the transportation fuel types considered "alternate" are biodiesel, electricity, ethanol, methanol, natural gas and propane.

For almost five years, various fuel producers, including the petroleum industry, have focused on the fuels and additives to be used in the carbon monoxide and ozone nonattainment areas of the country which are required to use cleaner-burning transportation fuels.

Nebraska's Quest for Cleaner Transportation Fuels

At the state level, the Governor's 1992 *Energy Action Plan* and the 26-member Alternate Fuels Committee serve as the guiding forces in increasing the use of cleaner-burning transportation fuels and reducing the state's overall dependence on petroleum-based fuels.

In 1995-1996, the Alternate Fuels Advisory Committee completed the publication and distribution of the *Nebraska Alternative Transportation Fuels Handbook*. *Nebraska Alternate Fuels Stations: A State Directory* was published and distributed in 1995. The two publications were financed by a \$15,000 regional U.S. Department of Energy grant and \$1,670 each from the state's Blue Flame, Power and Propane Associations as well as the state's Ethanol and Soybean Boards.

The Committee also participated in a June 1996 preliminary Clean Cities meeting in Nebraska City. Clean Cities is a voluntary, locally-based government and industry partnership, coordinated by the U.S. Department of Energy, to expand the use of alternatives to gasoline and diesel fuel.

Nebraska Ethanol Production Developments

In 1995, the state solidified its position as the number three ethanol producer in the nation. An estimated 16 percent of the state's annual corn crop is used to produce ethanol and other by-products. A total of seven operating plants are capable of producing up to 275 million gallons of ethanol annually, more than 18 percent of all ethanol produced in America. The plants employ 735 Nebraskans directly and an estimated 3,600 others indirectly — a total of 4,325 jobs.

85 Percent Ethanol Efforts in Nebraska

As part of a Governors' Ethanol Coalition effort (see related section on page 15), the Energy Office directly and indirectly coordinated efforts to increase the use of 85 percent ethanol as an alternate fuel both inside the state and across the nation:

- The agency coordinated the design and production of state specific brochures featuring the 1996 85 percent ethanol Ford Taurus. Thirteen Coalition states distributed nearly 28,000 brochures. Ford Motor Company agreed to pay the \$6,000 cost of the project.
- In March 1996, the agency, under two contracts totaling \$15,000, hired an 85 percent ethanol coordinator for activities in the state. The coordinator is responsible for some Clean Cities organizational activities as well as securing locations for public 85 percent ethanol stations in Nebraska. The state's first public 85 percent ethanol pump opened in Omaha in June 1996. Since March, the contractor has spent \$8,450. The federal Western Regional Biomass Energy Program supplied the funding for this effort.

"Nebraska and Ford are showing the rest of the world that cars can run on fuels that are friendly to the environment."

"The opportunity is not only a win-win for the farmers, the state and the environment, but an entire world that is far too dependent on traditional and vanishing resources."

Editorial, Grand Island Independent
January 12, 1996

Governor Nelson founded the Governors' Ethanol Coalition in September 1991. By 1996, 20 states and one territory were members of the ethanol policy and promotion group as well as representatives from Brazil and Sweden. The goals of the organization are to increase the use of ethanol, to decrease the nation's dependence on imported energy resources, improve the environment and stimulate the national economy.

1995-1996 Activities

During the reporting period, the Coalition undertook activities in several areas:

- In 1994-1995, the Coalition received a \$250,000 U.S. Department of Energy grant for the establishment of the National Ethanol Research Institute. In 1995-1996, the Coalition selected the Georgia-based Consortium for Plant Biotechnology Research to operate the Institute as well as an advisory committee to solicit and select research projects for funding. The first projects are expected to be selected in the 1996-1997 period.
- Continued to publish the biweekly *Ethanol Fax Alert* and the quarterly *Ethanol Alert* under a \$16,750 contract with a Virginia firm.
- The Iowa Department of Natural Resources, under a \$25,000 contract, hosted an August 1995 conference on the environmental aspects of ethanol. A total of \$18,060 was spent by the contractor. The funds came from a federal grant from the Departments of Energy and Agriculture.
- To expand the use of transportation fuels using higher percentages of ethanol, specifically 85 percent ethanol and 15 percent gasoline, the Coalition received, in a prior reporting period, a \$250,000 grant from the U.S. Department of Energy to develop a public fueling infrastructure throughout the Coalition's member states. The organization selected the National Corn Growers and its subcontractor, the National Ethanol Vehicle Coalition, headquartered in Missouri, to undertake the public fueling infrastructure development project. The original plan called for at least 40 fueling sites to be developed, including at least two in Nebraska. By June 1996, the contractor on the project had spent \$70,834, including \$62,794 this

Figure 10

reporting period, and 17 E85 public fueling stations had opened in seven Midwestern states.

Members of the Coalition continued to influence public policy debates:

- The U.S. Environmental Protection Agency lifted the cap on the amount of oxygenates that could be added to oxygenated fuels in the summer. The Coalition had requested the federal agency to take this action.
- The Coalition asked President Clinton to consider making reformulated gasoline available nationwide and not just in the nine smoggiest areas in the nation. The Environmental Protection Agency is considering this request.
- Coordinated responses to media requests, emerging issues and Congressional inquiries and hearings.

Natural Gas Technical Assistance

About 30 percent of the state's natural gas consumers receive their service from one of 14 municipally-owned natural gas utilities. The remaining 70 percent receive natural gas from one of four investor-owned natural gas utilities — KN Energy, Midwest Gas, Northwestern Public Service and Peoples Natural Gas Company.

One town in Nebraska may be unique in the entire country and provide a glimpse into the world of tomorrow's natural gas service. Kearney has granted franchises to two different investor-owned natural gas utilities to provide service to the town's residents. At this time, choice of service is only available to some larger natural gas customers.

Natural gas is imported into the state to the investor-owned and municipally-owned utilities primarily through major pipelines operated by Northern Natural Gas Company and KN Energy.

Municipal Natural Gas Regulation Act

Nebraska is one of only two states in the nation to regulate investor-owned natural gas suppliers at the local level. Village boards and city councils review rate requests under the state's *Municipal Natural Gas Regulation Act*. The Energy Office administers the Municipal Natural Gas Regulation Revolving Loan Fund, created by the *Act* to provide interim financing of rate regulation. The agency also provides technical assistance to communities as they perform their regulatory duties.

The 1996 Legislature amended the *Act* to allow for consolidation and use of videoconferencing of the rate area hearing in filings involving more than one rate area.

Revolving Loan Fund

The Municipal Natural Gas Regulation Revolving Loan Fund was initially capitalized with \$350,000 in oil and natural gas severance tax revenues. The fund finances local review of utility-initiated general rate requests and judicial review, if necessary. Groups of communities borrow

from the fund to finance the rate studies and the fund is replenished in the same amount by the utilities, which in turn recover the cost of regulation from the ratepayers.

Regulations governing the loan fund were adopted and took effect in 1987.

1995-1996 Loan Fund Activities

In 1995-1996, four groups of communities served by four different investor-owned utilities were involved in ratesetting activities financed with \$241,920 from the Municipal Natural Gas Regulation Revolving Loan Fund:

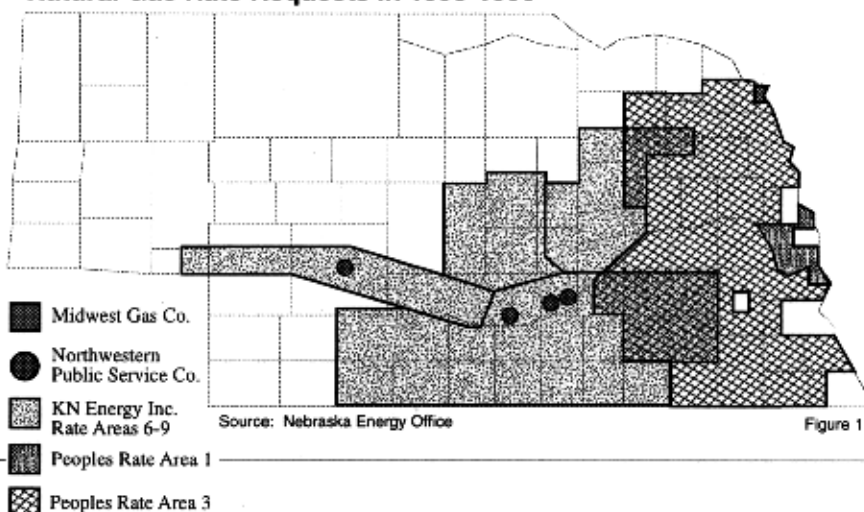
- Midwest Gas Company repaid the Fund \$11,108 for ratesetting activities on the utility's 1994 rate request. The four towns used \$261 during the reporting period in concluding their ratesetting activities.
- Northwestern Public Services rate request in four central Nebraska communities was concluded through a negotiated settlement. The cost of rate regulation was \$51,194 of which \$17,823 was incurred during the reporting period. A Fund reimbursement request was sent to the utility in June 1996.
- The 1990 rate request by KN Energy of central Nebraska communities in the utility's rate areas 6-9 was resolved in the utility's favor by the Nebraska Supreme Court. The cost of the most recent phase of the regulatory process was \$12,920. The utility was asked to reimburse the Fund in July 1996.
- Peoples Natural Gas Company filed for rate requests in two of the utility's three rate areas. The towns included Peoples' entire service territory except Lincoln. For the first time since passage of the *Act*, the two rate areas hired different consultants. The 94 communities in the eastern Nebraska reached a negotiated settlement with the utility during the reporting period and spent \$147,168 on rate regulation. The 11 suburban Omaha towns in Rate Area 1 could not reach agreement with the utility and filed suit in Lancaster County District Court. Rate Area 1 spent \$63,746 for rate regulation during the reporting period.

Technical Assistance

Throughout the reporting period, the Energy Office provided assistance to municipal officials during all phases of the regulatory process as mandated by statute.

Typical kinds of assistance include organizing and providing support services for rate area committees, publishing periodic issues of the *Natural Gas Rate Regulation Update* in each utility's service area, issuing requests for proposals for professional services, providing informational broadcasts and responding to specific inquiries regarding the regulatory process.

**Areas Receiving or Appealing
Natural Gas Rate Requests in 1995-1996**



Grants and Legislation

Grants

During the current reporting period, the Energy Office received several new one-time or project-specific grants for use by the agency or for regional groups. These new grants, totaling \$141,834 in 1995-1996, are detailed here and in other sections as indicated.

U.S. Department of Energy

Alternate Transportation Fuel

In 1994, the Energy Office received \$15,000 from the U.S. Department of Energy for alternate transportation fuel projects. The agency produced *Nebraska Alternate Fuels Stations: A State Directory* and the *Nebraska Alternative Transportation Fuels Handbook* with these and other funds contributed to the project. For more about this completed project, see page 14.

Climate Wise

In 1994-1995, the Energy Office was selected as one of seven pilot states to receive a two-year \$50,000 Climate Wise grant. Climate Wise is a voluntary partnership between the federal and state governments and industry to increase energy efficiency and reduce pollution. See page 12 for more information about Climate Wise activities.

National Industrial Competitiveness through Energy, Environment and Economics

In 1994-1995, the agency received a \$1,250 grant for the Energy Office to promote partnerships that develop and demonstrate advances in energy efficiency and clean production technologies. In 1995-1996, the agency teamed \$868 from the original grant with a new grant of \$3,583 to promote the federal program to industries and municipally-owned utilities in the state as well as providing technical assistance to interested firms and city officials. By June 30, 1996, \$1,157 remained unspent from the two grants.

Sustainable Technology Energy Partnership Pilot Program

In 1996, the Energy Office received a \$74,428 Sustainable Technology Energy Partnership Pilot Program grant from the National Renewable Energy Laboratory to provide partial funding for monitoring wind speed and direction as well as solar energy at eight locations in Nebraska.

The Nebraska Power Association, under contract to the agency, is the project coordinator for the wind study. As of June 30, 1996, none of these funds had been spent by the Power Association. For more about this project, see pages 12 and 13.

Weatherization Assistance Program

In 1995-1996, the Energy Office received a \$58,823 grant from the federal energy agency to augment Weatherization Assistance Program activities in Nebraska. The agency added these new funds to previously unspent funds allocated to Weatherization Assistance Program Landlord Loans to a new effort — below-market-rate mortgage loans for prospective home buyers on limited incomes. For more information about the Weatherization Energy Efficient Mortgages, see page 2.

Western Regional Biomass Energy Program

The Western Regional Biomass Energy Program is one of five regional projects across the country designed to develop short-term, cost-effective uses for biomass resources -- renewable organic matter, including forest residues, agricultural crops and wastes, wood and wood wastes, animal wastes, livestock operations residues, aquatic plants and

municipal wastes. Nebraska's region is administered by the Western Area Power Administration.

Two agency representatives serve on a program advisory board, which directs the regional program as well as specific projects.

During 1995-1996, the Energy Office received one new grant from the regional biomass program totaling \$5,000. To this grant was added a \$15,000 grant received in the previous reporting period, but not spent. Both grants were allocated to pursue the development of an 85 percent ethanol fuel station system in the state. See pages 14-15 for more information on this project.

A total of \$5,015 from a \$6,000 biomass energy grant received in 1994-1995 was spent to provide national satellite broadcast capabilities for a conference on bioenergy resources to generate electricity. The conference was held in June 1995. The balance of the funds remain unspent.

U.S. Departments of Energy and Agriculture

While no new funds were received from the federal Departments of Energy and Agriculture in support of the Governors' Ethanol Coalition during the reporting period, previously earmarked funds for an environmental conference were spent. See page 15 for more information on this conference.

U.S. Environmental Protection Agency

In 1994-1995, the agency received a non-competitive grant of \$103,837 to develop a national training program on how to use student interns to perform lighting audits in institutional buildings. The training program was based, in part, on the Energy Office's use of students in conducting Green Lights energy audits in state buildings.

In the current reporting period, Energy Office staff presented workshops in Washington, DC; Portland, Maine; San Francisco; Phoenix; and Boston. As a result of the workshops, similar student-

run efforts are underway in six states. The Energy Office also published a handbook describing how to operate a student operated program.

By June 1996, the agency had spent \$85,966. The balance of the funds will be spent in the next fiscal year.

Legislation

No significant federal energy legislation affecting Nebraskans was adopted by Congress during the reporting period.

In the 1996 session of the state's Unicameral, several energy issues of significance were addressed:

- Thorough examinations of the impact of federal deregulation of natural gas and electricity and their impact on the state were begun.
- A legislative committee is examining methods of increasing ethanol production and use in the state by looking at extending production incentives to non-grain feedstocks.

Fiscal and Organizational Notes

Financial Review

The accompanying figures illustrate the Energy Office's income and expenses from July 1, 1995, through June 30, 1996, which amounted to \$13,490,820 and includes federal funds, state funds and oil overcharge funds.

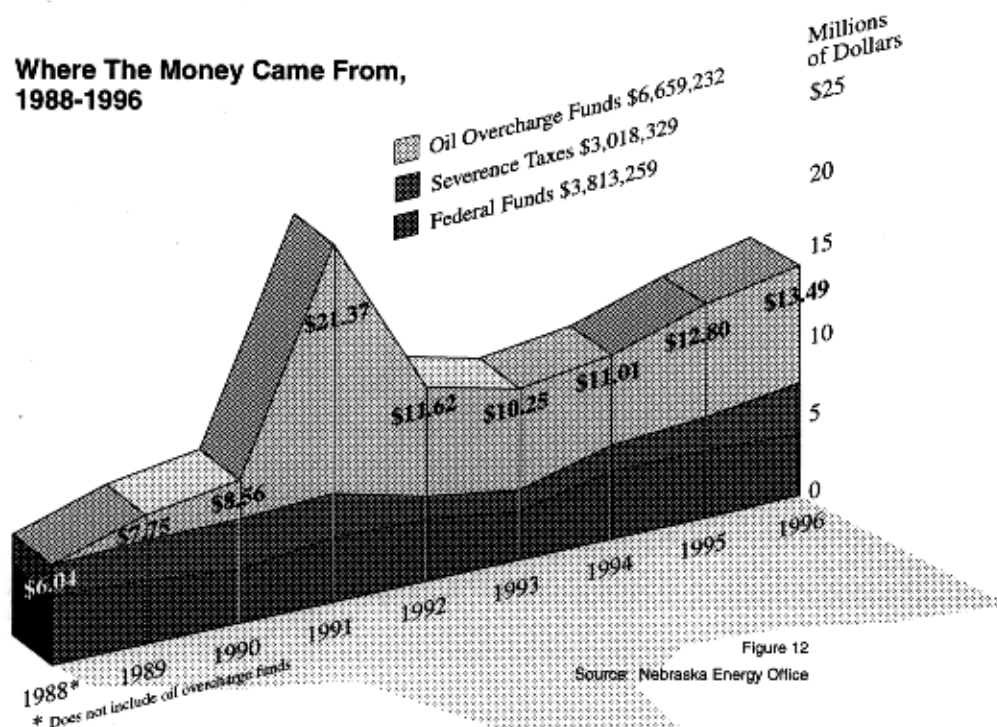
Approximately 49 percent of the agency's funding came from oil overcharge funds, a four percent decrease from the previous year.

Oil overcharge funds and state severance tax funds increased by nearly 23 percent and about 19.5 percent respectively. The appearance of an increase in both types of funds was, in fact, increased activity — loans being made and repaid.

State funds came exclusively from severance taxes. No state general funds have been appropriated to the Energy Office since 1983.

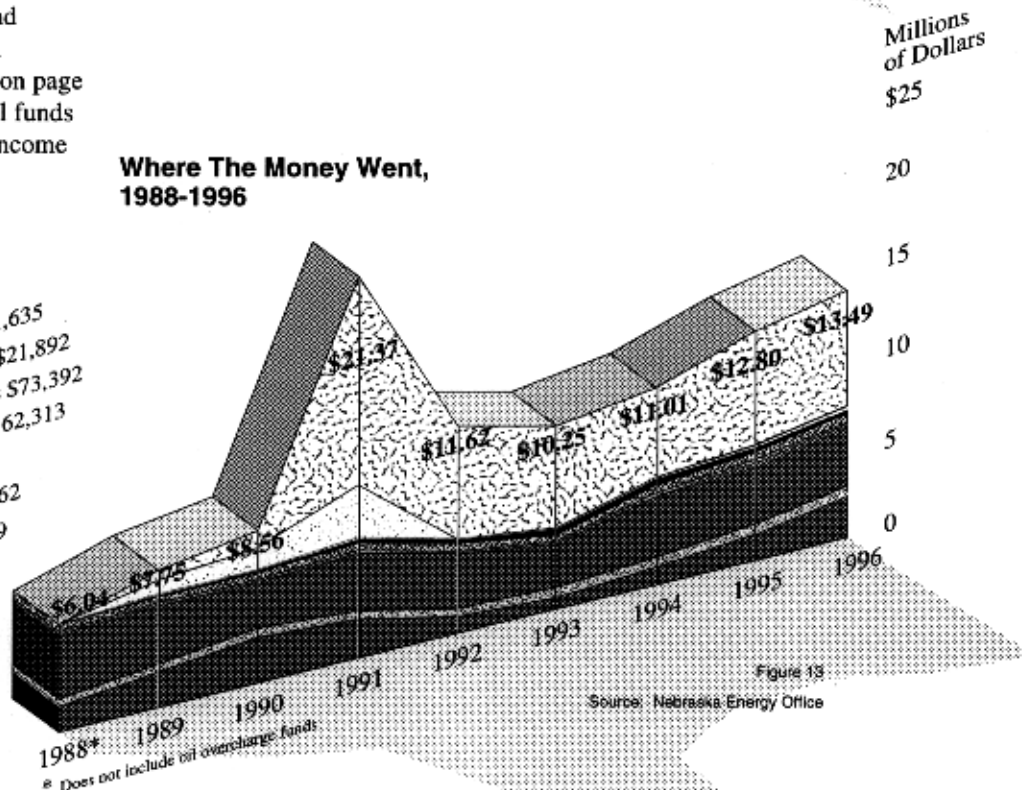
Forty-eight percent of all expenditures were used for oil overcharge aid and contracted projects listed in the Oil Overcharge Funds section starting on page 6. Eighty-one percent of all federal funds were expended as aid in the Low-Income

Where The Money Came From, 1988-1996



Where The Money Went, 1988-1996

- Oil Overcharge Aid \$6,401,635
- Oil Overcharge Contracts \$21,892
- Oil Overcharge Operations \$73,392
- Oil Overcharge Salaries \$162,313
- Federal Salaries \$456,579
- Federal Operations \$111,062
- Federal Contracts \$156,889
- Federal Aid \$3,088,729
- State Salaries \$432,469
- State Operations \$100,836
- State Contracts \$2,142
- State Aid \$2,482,882



Weatherization Assistance Program. In excess of 82 percent of all state severance taxes were spent as aid under the School District Energy Efficiency Program.

A full accounting of the Energy Office funds appears in figures 12 and 13.

Overall, the agency spent state, federal and oil overcharge funds in eight different ways. Aid, which makes up the largest portion of the agency's expenditures, consists of money from the three sources which is received and passed on to delegate agencies or directly to

beneficiaries such as schools, hospitals, small businesses, local governments and individuals. Money spent for operations pays travel, telephone, computers, salaries and other office expenses.

A more detailed accounting of the oil overcharge funds appears on pages 6 and 7.

Organization

The Energy Office was created in November 1973 as the Fuel Allocations Office, a division of the Nebraska Department of Revenue. The agency had independent status from 1977 to January 1987, when it became by Executive Order of the Governor, a division of the Governor's Policy Research Office.

The organizational chart below (figure 14) shows the functional structure of the Energy Office during the reporting period.

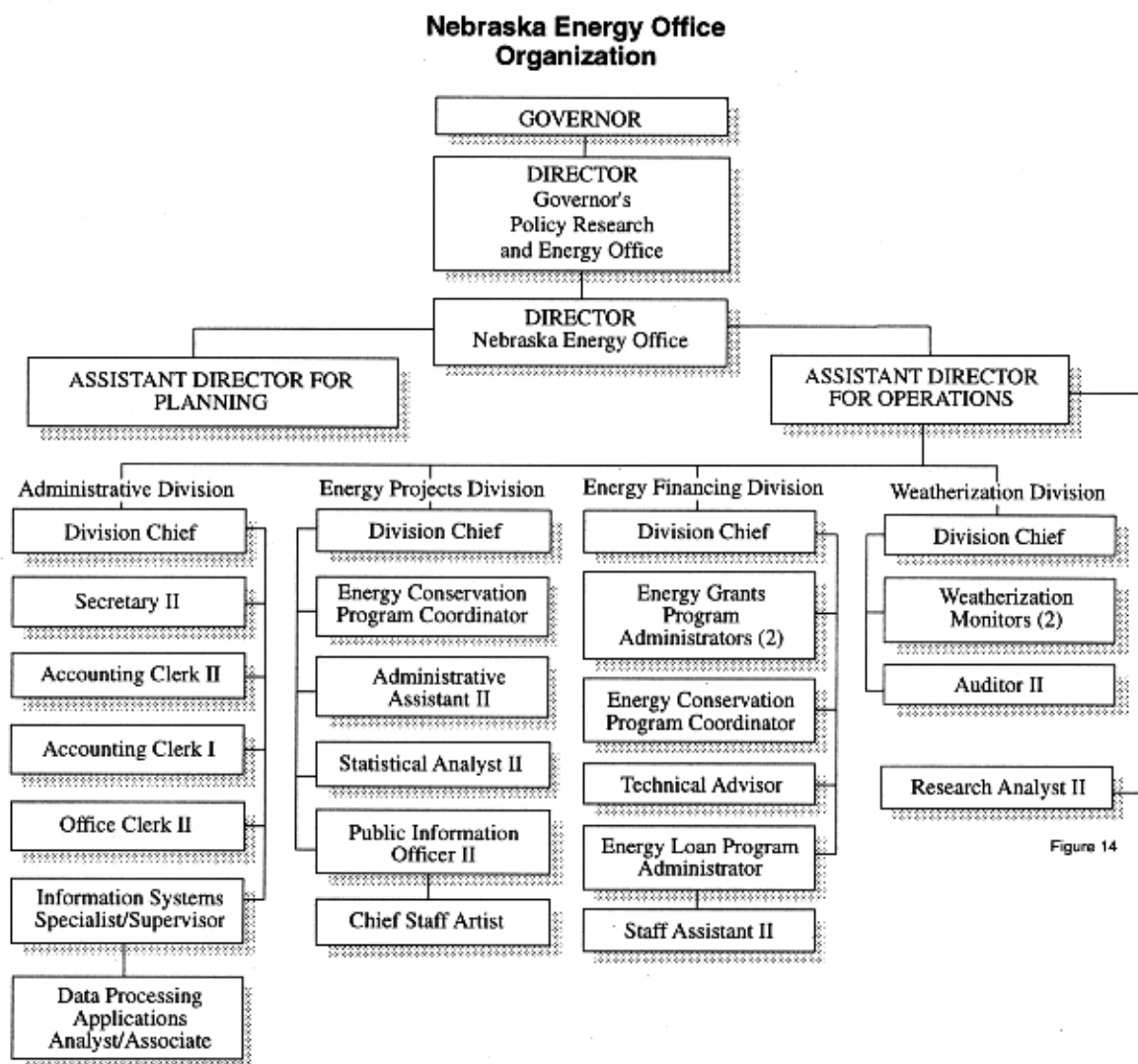


Figure 14

Source: Nebraska Energy Office

Issues and Trends

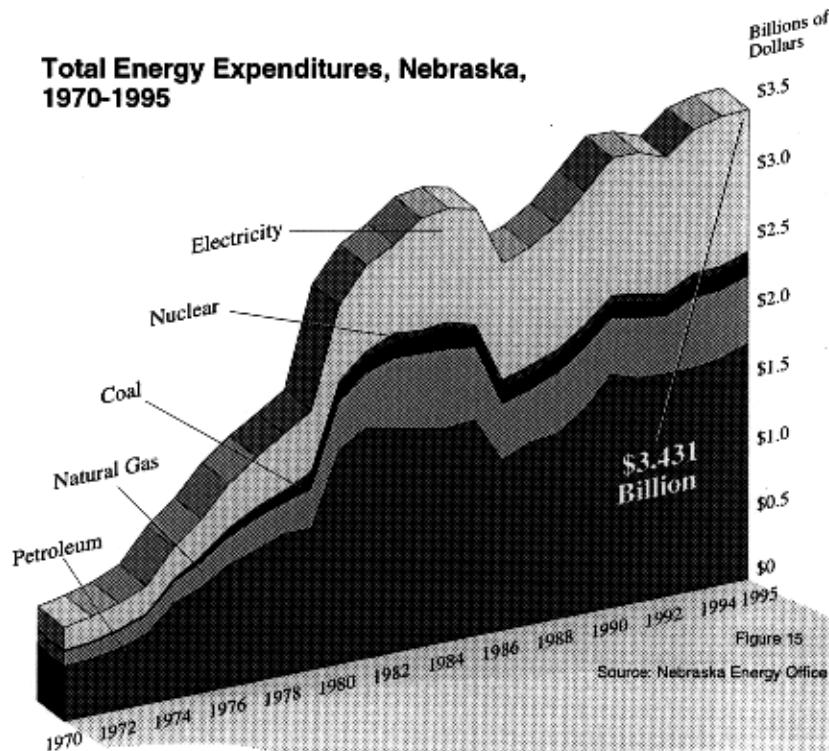
Introduction

At least annually, the Energy Office is required to "identify emerging trends

52.7 percent in 1995 — were for petroleum and its refined products used in the state. Nebraska's petroleum bill for 1995 totaled \$1.807 billion.

Energy consumption, which rose for the past two years, again rose in 1995 to an all-time record of 591.5 trillion British thermal units.

Total Energy Expenditures, Nebraska, 1970-1995



related to energy supply, demand and conservation and to specify the level of statewide energy need within the following sectors: agricultural, commercial, residential, industrial, transportation, utilities, [and] government..." This section addresses those requirements as well as chronicles international, national and state trends and issues.

Energy Costs and Consumption

For the sixth consecutive year, Nebraska's total energy bill topped \$3 billion — exactly \$3.43 billion in 1995. Again, a new all-time, record high was established, surpassing last year's total of \$3.232 billion.

The cost of the state's petroleum dependence remained unchanged. Just over half of all energy expenditures —

1994 to 71.3 trillion British thermal units, surpassing the record set in 1992. The anomaly in interstate sales is attributable to Cooper Nuclear Station in Brownville returning to service.

Separate energy use and production information is provided for electric producers in the Electricity portion of this section of the *Annual Report*.

The Top Story: Nebraska's Changing Transportation Picture

In 1995 and 1996, the energy issue affecting the greatest number of Nebraskans was not one, but several, all relating to changes in the use of energy in the transportation sector:

- fluctuating energy prices,
- exchanging fuel-misers for gas-guzzlers,
- increasing highway speed limits,
- driving more miles each year, and
- changing levels of government taxation on transportation fuels.

All sectors — residential, commercial, industrial (including agriculture) and transportation — recorded increases in energy consumption. The transportation and industrial sectors recorded the largest percentage increases, 9.3 percent and 5.2 percent respectively. Both sectors — transportation at 170.7 trillion British thermal units and industrial at 162.0 trillion British thermal units — neared all-time record highs set during the second oil-shock years of 1975-1979. Contributing factors for the increases were the strong state economy and familiar as well as new factors influencing the transportation sector. Those issues are addressed in the Top Story for 1995.

While energy use in the commercial sector set a record at 124.1 trillion British thermal units, the increase was less than three trillion units more than 1994.

Residential use increased to 134.7 trillion British thermal units, a 1.9 percent rise and a new all-time record.

One of the most dramatic changes in 1995 was the amount of electricity sold to users outside Nebraska. Sales registered a more than four-fold increase from.

"Yes, gas is relatively cheap. But that could change as the motoring public burns greater amounts of fuel because of higher speed limits. Certainly no more petroleum is being created. Eventually the Earth's reservoirs will be depleted of their easy-to-recover oil. How much sense does it make to fill the roadways with low-gas-mileage sport-utility vehicles, driving as fast as possible and slipping back into the vulnerable, energy-dependent condition that existed in the early 1970s? The next shock wave of tight supplies, when it comes, could be even more painful."

Editorial, *Omaha World-Herald*
May 21, 1996

While some of the transportation elements are not new, others represent a reversal of recent trends, and when taken as a whole suggest an increasing overall petroleum dependency for Nebraskans.

Cheap Gas and Fuel Taxes

Energy Prices

Despite the relatively low cost of gasoline and other transportation fuels for most of the reporting period, a new all-time record of \$1.533 billion was spent by Nebraskans for transportation costs in 1995. Because fuel costs rose dramatically in the spring of 1996 — from \$20 to \$26 for a barrel of oil and generally stayed higher for the remainder of 1996 — transportation costs for 1996 are likely to set another new record. The 9.3 percent increase in transportation expenditures from 1994 to 1995 represented the largest percentage increase since the oil-shock of the 1970s.

America, unlike European nations, has chosen to maintain a cheap transportation fuel policy where the total cost of energy is not incorporated into what consumers pay. These “hidden costs” include costs associated with pollution from the use of fossil fuels and military costs of maintaining a permanent defense contingent in the Persian Gulf.

Most energy analysts say the new volatility of oil prices has been caused by a change in how oil refiners conduct business. To increase profits, most refiners have adopted “just in time” production of refined oil products such as gasoline, diesel and other fuels as well as sharply curtailing the inventories they maintain. Another factor that didn’t exist five years ago, is the fuels futures markets. Energy markets, like other commodity markets, are extremely price and event sensitive and can exaggerate price fluctuations.

During the reporting period, a new fuel began being used in California which exacerbated price fluctuations in the spring of 1996. The fuel is

Dollars for a Gallon

Average gasoline prices, for a gallon in U.S. Dollars on April 15, 1996

Country	Price
Belgium	\$4.06
France	\$3.99
Germany	\$4.03
Italy	\$4.09
Japan	\$3.76
Netherlands	\$4.43
United Kingdom	\$3.03
United States	\$1.42

Source: U.S. Department of Energy

environmentally cleaner than the reformulated gasoline sold in other smoggy regions of the nation. However, one aspect of the nation’s transportation fuel system has gone unnoticed: with the advent of cleaner burning fuels that are used only geographically or seasonally, the ability to move diesel or gasoline from one region to another to meet demand has been compromised. For example, only California reformulated gasoline can be used in vehicles in California. As a result, gasoline used in Seattle or Texas cannot be transported into California to meet unanticipated demand or product disruptions. The result is often unanticipated price spikes.

Also during the reporting period, the most popular alternate transportation fuel in the state, ethanol, experienced price shocks of a different type. Beginning in the spring of 1996, the primary feedstock used in the production of ethanol, corn, began to rise in price. By June, the price for a bushel of corn topped \$5, nearly double recent prices for a bushel of corn. The price surges were attributed to the lowest corn stockpiles in 20 years.

Ethanol production was curtailed at some plants in Nebraska as well as across the nation. Energy analysts projected that 1996 production would be 30-40 percent below

1995 production levels because of the rise in corn prices. Ethanol producers have indicated that feedstock costs must be less than \$3 a bushel to maintain profitability.

Nebraskans should expect price shocks for transportation fuels in the future. As one petroleum industry watcher noted, “a disruption anywhere [in the world] is a price shock everywhere.”

Fuel Taxes

During the height of the gasoline price increases in late April 1996, some policymakers called for the repeal of a portion of the federal gasoline tax. In 1993, the federal tax was raised by 4.3 cents a gallon to 18.3 cents with the increase dedicated to budget deficit reduction. A repeal of the 1993 increase was suggested by some in Congress. The increase generates \$4.8 billion annually.

In May 1996, the House of Representatives passed repeal of the 1993 tax increase, but the issue failed later in the year in the Senate.

At about the same time as some Americans were seeking a rollback in a portion of the federal gas tax, some Nebraskans were suggesting the state should reconsider a planned increase in the state part of the gas tax. Nebraska’s gas tax is comprised of two parts: a fixed

“Americans pay less for motor fuels than just about anyone else in the world. Cheap gas leads to waste. A realistic tax not only encourages conservation but also produces needed revenue to build highways and, in the case of the 1993 increase, to reduce the federal budget deficit.

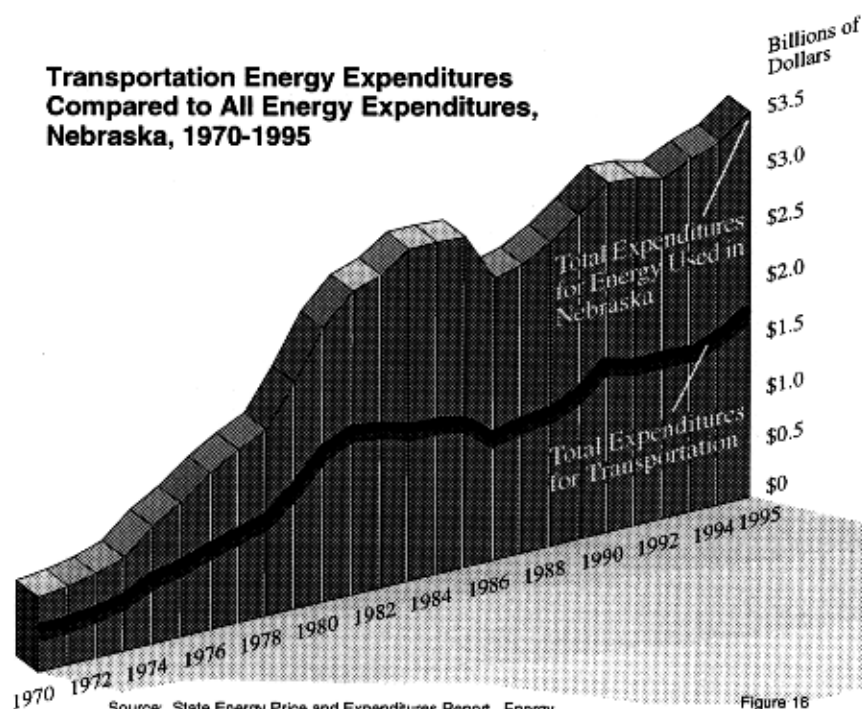
“If anything, the 1993 increase was too modest.”

Editorial, *Omaha World-Herald*
May 8, 1996

“Whether we are willing to acknowledge it or not, gasoline is still a bargain in the United States, despite state and federal taxes.”

Editorial, *Lincoln Journal Star*
May 2, 1996

Transportation Energy Expenditures Compared to All Energy Expenditures, Nebraska, 1970-1995



Source: State Energy Price and Expenditures Report. Energy Information Administration. U.S. Department of Energy.

Figure 18

tax of 12.5 cents a gallon and a variable portion that is set quarterly by the state's Board of Equalization based on road construction planned for the next year. In May 1996, the Board decided to reduce the planned increase of .8 cents a gallon by half. As of July 1996, Nebraska's state gas tax will total 26.1 cents a gallon, fifth highest in the nation according to the state's Department of Roads.

The Return of Gas Guzzlers

Somewhat less pronounced in Nebraska is the dramatic change in the type of vehicles being driven. Nationally, according to the federal Department of Transportation, four out of every ten new vehicles purchased are classified as "light trucks." "Light trucks" include vans and sport utility vehicles.

Nebraska vehicle numbers are consistent with a rural, agricultural state — 55 percent of the new vehicles purchased in 1994 and 1995 were trucks, vans and sports utility vehicles. According to the U.S. Department of Energy, vehicles such as the popular sports utility vehicles usually get less than

20 miles per gallon of gas, some as low as 14 miles per gallon.

What has changed dramatically in the past 15 years is the number of motorcycles. In 1980, more than 52,000 motorcycles were registered in the state, but by 1995, the number had dropped to 18,696.

While substantial fuel efficiency gains have been made in passenger vehicles since 1975, the same is not true for trucks. According to a 1995 Environmental Protection Agency study, passenger cars averaged more than 28 miles a gallon while trucks averaged slightly more than 20 miles a gallon.

When Nebraskans switch from driving a passenger car to a truck, van or sport utility vehicle, they are usually trading in a more efficient vehicle for one that is less efficient.

So Long to Federal Speed Limits

In 1974, the federal government, in an effort to reduce dependence on foreign oil, imposed a 55 miles per hour speed limit on all federal highways. In 1987, Congress allowed speed limits on rural interstate highways to rise to 65 miles per hour. In November 1995, the President signed legislation

repealing the federal limits and allowing states to set speed limits.

In 1996, the state's Unicameral passed legislation raising speed limits on interstate and state highways. The speed limit changes were phased in and became effective June 1 and September 1 across the state.

While there are some exceptions, speed limits on interstate highways increased to 75 miles an hour. Speed limits on most state roads increased to 65 miles an hour.

According to the American Council for an Energy Efficient Economy, traveling at 75 miles an hour instead of 55 results in an average 50 percent increase in fuel consumption. Traveling at speeds above 55 miles an hour also increases auto exhaust emissions.

The American Trucking Associations' Maintenance Council has found that for each one mile an hour increase in speed, there is a 2.2 percent increase in fuel use and a 10 to 15 percent increase in maintenance costs such as tires, oil and engine wear. In legislative testimony, an Omaha trucking firm owner estimated that raising speed limits could add \$25 a day in fuel costs for truckers.

By May 1996, the *New York Times* reported that all states west of the Missouri River except Oregon and North Dakota had raised speed limits on rural interstate highways to 70 miles an hour or higher. Montana set a top daytime limit that is "reasonable and prudent," foregoing fixed speed limits.

"The original rationale for the 55-m.p.h. limit — to improve automobile gas mileage and 'reduce our dependence on imported oil' — no longer holds."

Editorial, *South Sioux City Star*
July 6, 1995

"The virtue of fuel conservation should not be abandoned — anymore than a government should increase spending simply because a budget crunch may be over."

Editorial, *Omaha World Herald*
August 22, 1995

Higher and Higher

Nebraskans, like other Americans, are traveling more and more miles each year. Since 1985, Nebraskans have been adding a billion more miles traveled every two to four years. In 1991, motor vehicle miles totaled 14 billion miles according to the state's Department of Roads. By 1995, Nebraskans traveled 15.8 billion miles. Trends over the past 18 years are illustrated in figure 17.

This trend is unlikely to change as urban, eastern Nebraska becomes more populous and its cities continue to grow into the countryside. While population trends in central and western Nebraska have stabilized, even there population concentrations and other factors such as employment and housing are requiring Nebraskans to commute further and further for work, health, education, commerce and pleasure.

The Direction Nebraskans Are Headed

Trends outlined in 1995-1996's top story indicate Nebraskans will be paying more for transportation fuels in the future as well as allocating a larger percentage of their budgets to fuel costs, unless the trends outlined in this section change.

As a result, the state will increase its transportation energy dependency even further.

Electricity

State Production and Consumption

In 1995, energy use by the state's electric utilities was 269.8 trillion British thermal units, an increase of 12.5 percent from the 1994 total of 236.3 trillion British thermal units, and a new all-time record. Nebraskans paid \$1.11 billion for the electricity they used in 1995, an all-time record high.

Electricity produced in the state is produced from coal, nuclear, hydroelectric, natural gas, and petroleum. The first three fuel sources represent the vast majority of electricity resources used in the state. Natural gas and petroleum for the production of electricity are used primarily for smaller peaking units that generally operate in the summer.

Specifically, electrical production in 1995 increased by 3,332 million kilowatthours from 1994 to 25,279 million kilowatthours, a new all-time record. Electricity from coal, at 16,080 million kilowatthours, accounted for 63.6 percent of the production. Nuclear power, at 7,485 million kilowatthours, accounted for 29.6 percent. Electricity from hydropower units, at 1,426 million kilowatthours, accounted for 5.6 percent of all power production. Natural gas and petroleum accounted for just over one percent. A new

source of fuel — shredded tires — accounted for just a fraction of one-tenth of one percent, just slightly less than petroleum used for electricity production.

National Trends

The trend of utility deregulation continues to focus on electric power companies. As with the deregulation that occurred in the natural gas industry, the movement to "unbundle" the electric utility system is coming from two directions — the Federal Energy Regulatory Commission at the national level and state-level public utility commissions. "Unbundling" would separate a utility's power production, transmission and local distribution systems.

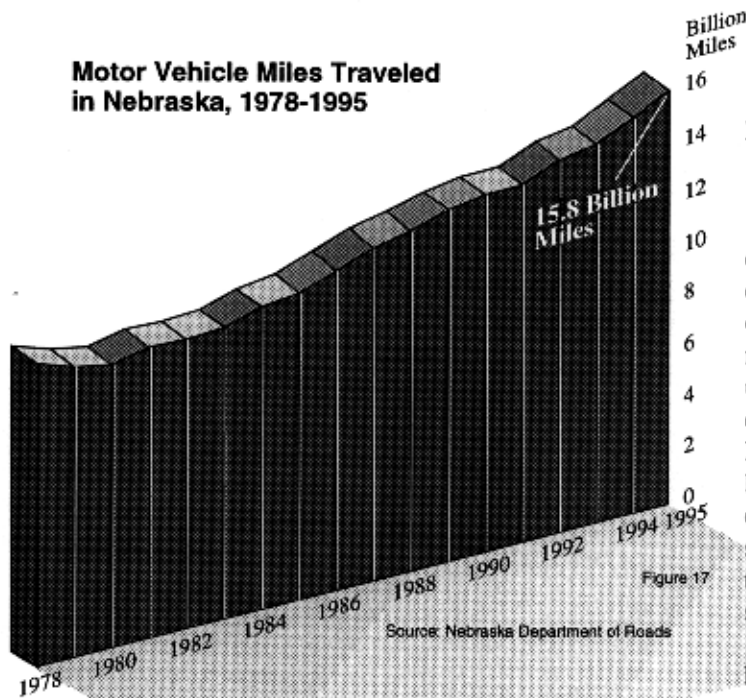
Initially, deregulation would allow the largest electricity users to directly purchase the electricity they need from any producer and ship it over the lines owned by the utilities.

It is anticipated that deregulation will occur first in the areas where electric rates are highest, particular New England and California. During the reporting period, several small groups of consumers in several states began deregulatory tests. The largest test in New Hampshire included 16,000 customers. The state deregulatory plans unveiled to date, generally call for a phased effort spread over several years, and extending into the next century. Usually, residential customers are in the final deregulatory phase.

Electric utilities in the state are watching the deregulation developments very closely. In the 1996 session of the state's legislature, a resolution was passed calling for a multi-year study of deregulatory effects on the state's public power system. However, the relatively low cost of electricity in the state may forestall significant changes to the traditional utility structure in Nebraska.

Three issues are linked to electric utility deregulation: how to deal with costs such as power plant construction incurred earlier by utilities for which a rate of return has been guaranteed, minimizing

Motor Vehicle Miles Traveled in Nebraska, 1978-1995



rate shifts from one customer group to another such as from industry to residential customers and how rate competition could undermine energy efficiency and renewable energy growth.

State Issues

The issues confronting the state's utilities generally parallel those in other regions of the country, however, some are truly local in nature such as power line construction.

Deregulation Issues

One of the issues related to deregulation — the rates charged for use of utility transmission lines embroiled two of the states power providers, Nebraska Public Power District and the Municipal Energy Agency of Nebraska. In November 1995, the two agreed to withdraw legal and federal regulatory actions and to mediate a solution. In February 1996, an agreement was reached regarding the rate charges.

In a related action in April 1996, the Federal Energy Regulatory Commission ordered all electric utilities in the nation to open their transmission systems to outside energy providers, and to charge outside energy providers the same transmission rates they charge themselves.

The previously mentioned multi-year legislative study sparked public debate across the state of whether the state's public power system should be privatized. In the past several years, two members of public power boards have suggested the sale as a method of generating revenue to be used to lower property taxes and for other uses. However, while the issue will be examined by the legislative committee, sale of the state's systems will not be seriously considered, according to the committee's chairman.

Sale of Western Area Power Administration

Some in Congress and the Executive branch have proposed the sale of Western Area Power Administration as well as several other federal power marketing agencies. The federal agencies produce and sell inexpensive hydropower to

"As long as rates are low and service is dependable, we would be wise to stick with our public systems."

Editorial, *Kearney Hub*
March 13, 1996

"Nebraska's all-public electric system is unique; it's the only one in America. It is an island of socialism in a sea of free-enterprise capitalism."

"But it is socialism that works. Economical, dependable electric power is one of the state's reliable economic advantages, for average consumers and for businesses that use large amounts of power."

Editorial, *Hastings Tribune*
March 20, 1996

"The notion of selling off generating facilities for a short-term property tax relief doesn't appear to work for the state's longer term benefit."

Editorial, *Lincoln Journal Star*
March 23, 1996

publicly-owned electric utilities and state and local governments. Western provides an estimated 10-15 percent of the state's annual electricity needs.

Throughout the reporting period Congress continued debating the sale of one or more power administrations. However, during budget negotiations, plans to sell any of the power administration except Alaska were scuttled. Plans to balance the budget may dictate reconsideration of the sale in the future.

Kingsley Dam Relicensing

The twelve-year struggle to obtain a new 30-year renewal of the hydropower dam at Lake McConaughy, north of Ogallala, continued. As of February 1996, more than \$20 million had been spent on license renewal issues according to the two utilities that operate hydropower facilities on the river.

The Federal Energy Regulatory Commission license to operate the hydropower facility was originally issued in 1941 and expired in 1987. Since that time, only annual operating licenses have been issued pending the resolution of seemingly conflicting issues — irrigation, power generation, recreation, fish and

wildlife welfare, municipal interests and flood control.

Any solution is further complicated because the Platte courses through Wyoming and Colorado and actions taken there can have impacts downstream in Nebraska. In mid-1995, governors from the three states agreed to continue discussions on resolving water and environmental issues. The discussions began in 1994 and the federal government wants the states' issues resolved before a new license is issued.

By June 1996, a long-term license renewal for the hydropower facilities had not been issued.

Pauline Moore

In October 1993, Nebraska Public Power District approved spending \$57 million to build a second 345 kilovolt transmission line between the Pauline substation south of Hastings and the Moore substation near Crete.

The utility said the earlier loss of a similar line in a 1993 wind storm pointed to a weakness in the transmission system. The utility also cited increased transmission sales and elimination of bottlenecks as factors in the decision to build the line. Opponents of the power line questioned the need and safety of the line.

Through 1995 and 1996, the process to acquire the land over which the transmission line would pass continued. Actual construction of the power line began in May 1995. Service on the line began in late April 1996. At the time, 12 lawsuits in opposition to the power line were pending.

In June 1995, a three-year, \$65 million, definitive federal study of the effects of electromagnetic fields generated by transmission lines such as the Pauline Moore line

was begun at the Department of Energy's Oak Ridge Laboratory.

Other highlights during the period:

- In early 1995, Lincoln Electric System announced its intention to join several non-Nebraska utilities in building a coal-fired electricity plant in northwestern Missouri. The utility said that it could acquire up to 150 megawatts of electricity to meet the utility's growth projections and to replace the 97 megawatts of power it receives from the Cooper Nuclear Station that is scheduled to close in 2003. The utility's share of the cost is estimated to be \$157 million.

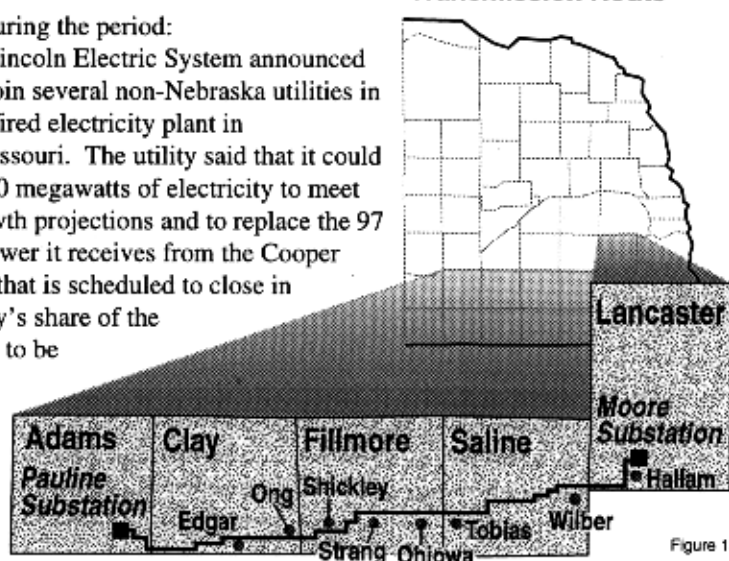
By June 1996, only the state's Power Review Board had approved the project.

Approval was pending with

the utility's board and the Lincoln City Council. In June, the Iatan partnership announced the project would not begin generation until 2004, a three-year delay.

- According to the Utility Data Institute, Lincoln Electric System's Laramie River Station in Wyoming had the lowest costs per net megawatt-hour of electricity in 1990-1994. More than 700 steam and electric power stations were included in the survey. This was the second time the Wyoming plant had achieved the honor.
- Two rural electrics, Wayne County Public Power District and Northeast Nebraska Rural Public Power District, continued to explore merger options.
- An idled power plant that was slated for demolition is under consideration by Nebraska Public Power District as a coal plant for eastern Nebraska. Re-starting the Kramer plant near Bellevue was studied earlier, but according to the utility, a number of factors have changed and a new analysis is warranted.
- New heads for two of the state's top electric entities William Mayben of Nebraska Public Power District and Larry Marquis of NMPP Energy, were named.

Pauline Moore 345KV Transmission Route



Source: Nebraska Public Power District

Figure 18

In comparison, an estimated 18-19 percent of all electricity used in the world in 1995 came from nuclear power, about the same as the previous year.

National Trends

While the United States has the greatest nuclear capacity in the world, future capacity is expected to increase only three percent in the next decade. By 2010, America's nuclear capacity will decline from 99 gigawatts to about 93 gigawatts as older units are deactivated. A gigawatt is one million kilowatts.

The nuclear power industry has stalled in America because of three factors: high operating and construction costs relative to other fuel sources and unsolved nuclear waste disposal. No new nuclear power plants are planned.

In 1995, the outgoing chairman of the Nuclear Regulatory Commission suggested that the nuclear industry could rebound only if the issues surrounding storage of spent nuclear fuel were resolved. During the reporting period, the Commission approved rules allowing operating nuclear facilities to continue for 20 more years after their 40-year operating license had expired.

Other highlights during the period:

- In 1996, the first of four Washington Public Power System nuclear plants to be dismantled without producing any electricity will begin. Construction on the plants was halted in 1983 when costs soared and the utility's rates tripled.
- Since the nation's first nuclear reactor was built in 1942, the federal government has spent \$30 billion on nuclear research according to Congressional sources. However, the federal government, in recent years, has dramatically reduced funding of these projects.
- Some suggest the latest challenge to nuclear power may come from deregulation of the electric industry. Since nuclear power is the most expensive form of electricity, rate wars between competing power providers could cause the premature

Nuclear Power and Nuclear Waste

State Production and Consumption

Nuclear generated electricity in the state in 1995 reversed a two-year decline, increasing to 79.9 trillion British thermal units. Only 67.8 trillion British thermal units were produced from nuclear power in 1994 due to the continued shutdown of Nebraska Public Power District's Cooper station near Brownville. The facility shutdown in May 1993, but did not resume full power until February 1995.

Nebraskans paid \$52 million in 1995 for the nuclear generated electricity used in the state, up from \$44 million in 1994.

Nebraskans who receive electricity from Cooper should expect to pay more for the power than in the past. During the review of the facility by the Nuclear Regulatory Commission, the station's operator realized the facility's staffing level needed to be increased.

Only 13.5 percent of all energy used in the state in 1995 came from nuclear power, an increase of more than one percent from 1994.

closing of plants, especially in areas with high electric rates.

- One of the best hopes for a new generation of nuclear reactors collapsed in early 1996, when Japan's first fast-breeder reactor was shutdown because of a dangerous coolant leak. Optimistic officials expected a three-year delay in restarting the reactor. Fast-breeder reactors produce more fuel than they consume.

Japan has already spent three decades developing the fast-breeder reactor and had expected to begin commercialization in 2030. Japan is the only nation still developing this type of nuclear plant system.

Nebraska Nuclear Facilities

The state has two nuclear power generating facilities — Fort Calhoun Nuclear Station operated by Omaha Public Power District and Cooper Nuclear Station near Brownville operated by Nebraska Public Power District. Fort Calhoun is one of the older commercial nuclear facilities still operating in the nation.

State Trends

No new nuclear facilities are planned for construction by utilities in the state due to cost inefficiencies and unsolved storage issues for low- and high-level waste.

Highlights during the reporting period:

- In the fall of 1995, the Nuclear Regulatory Commission, in a systematic assessment of the Cooper Nuclear Station, said that performance at the station had improved since restarting, but that more improvement was needed in maintenance and engineering.

A routine outage in 1993 developed into a prolonged outage and management shakeup at Nebraska Public Power District's Cooper Station. When operating, Cooper produces about one-third of the utility's electrical generation and up to one-third of Lincoln's electrical supply. The plant resumed full operation in 1995.

In March 1996, the Nuclear Regulatory Commission announced that several minor violations occurred at the Cooper plant in February. The nuclear agency fined the utility \$50,000 for these violations. Earlier violations at the plant totaled \$700,000.

- In May, 1996, the Nuclear Regulatory Commission announced that errors in refueling procedures occurring at a Connecticut nuclear plant were happening at 14 similar plants including the Cooper facility in Nebraska. While the utilities consider the refueling practice to be common and safe, the utilities agreed to analyze the procedures. The practice involves storing all, not some, of the nuclear fuel assemblies in spent fuel pools. Normally, only one-third of the fuel assemblies are replaced during refueling.

Nuclear Waste

The majority of nuclear waste in the state is produced by the two nuclear power stations. For storage purposes, radioactive material is classified as high- or low-level waste depending on the length of time the waste remains radioactive.

High-level waste is spent nuclear fuel and has primarily been stored on site at the nuclear power plants awaiting construction of a temporary or permanent repository. Fort Calhoun has storage capacity until 2007. The Cooper station expects to exhaust on-site storage by 2002.

Permanent High-Level Waste

The *Nuclear Waste Policy Act*, passed by Congress in 1982, set forth the storage options for the radioactive waste:

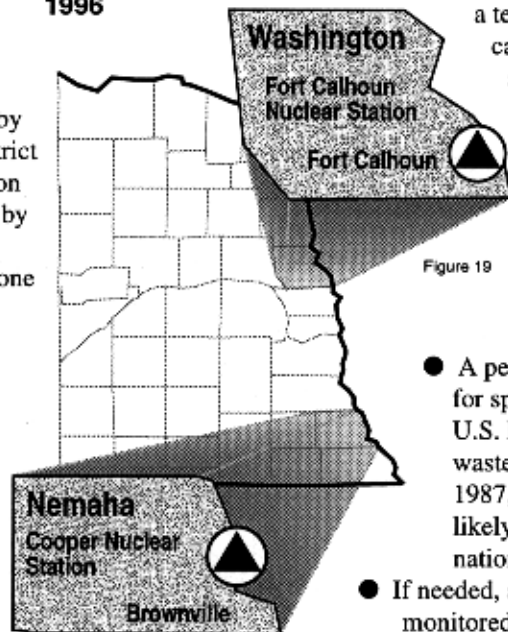
- Defense Department radioactive waste would generally be segregated from commercial radioactive waste and stored at the Waste Isolation Pilot Plant.
- A permanent storage facility would become the final repository for spent nuclear fuel from commercial reactors. By 1998, the U.S. Department of Energy was supposed to start picking up the waste from nuclear reactors and move it to the permanent site. In 1987, Congress selected Yucca Mountain, Nevada, as the most likely site, if found suitable, for spent nuclear fuel from the nation's 109 reactors.
- If needed, a temporary radioactive waste storage facility, called monitored retrievable storage, would be located at an undetermined site.

To finance the Yucca Mountain site, utilities with nuclear generators have been paying one-tenth of a cent per kilowatt-hour produced by the reactors. As of mid-1996, more than \$140 million has been paid by Nebraskans into the nuclear waste fund.

Waste Isolation Pilot Plant

The furthest developed facility, the Waste Isolation Pilot Plant, was begun in 1983 near Carlsbad, New Mexico. Designed to store radioactive wastes resulting from the production of nuclear weapons, it is also a test of the use of prehistoric salt beds to entomb radioactive waste. This waste will remain deadly for 240,000 years.

Nebraska Nuclear Power Plant Locations by County, 1996



Source: Nebraska Energy Office

Figure 19

The \$1 billion storage plant has been plagued by technical, legal and political problems and may never become fully operational. This storage option for defense waste remains questionable despite costs of \$14 million a month.

Yucca Mountain

Since the selection of Yucca Mountain, the federal energy agency has faced both technical problems and local opposition. While site testing continues, the revised operational date of 2010 may again be postponed. More than \$1.8 billion has been spent to date evaluating the proposed site.

Since 1995, both houses of Congress have attempted to make the selection of Yucca Mountain permanent. However, the opposition by Nevada, as well as others, has prevented this from happening. In 1996, the House also considered building a temporary storage site at Yucca Mountain. As before, the two houses of Congress could not reconcile differences on the issue. As more and more nuclear plants exhaust on-site storage, the issue of temporary storage will become one of greater concern.

In July 1994, the U.S. Department of Energy was challenged in two separate lawsuits to provide a storage site by 1998, the original operational date for permanent storage. Fourteen investor utilities filed one lawsuit, and 27 public agencies filed the second legal action. Nebraska joined the public agency lawsuit on behalf of the state's ratepayers who had contributed to the construction fund for the storage facility. During the reporting period, the Court declared that the U.S. Department of Energy must begin accepting waste in 1998. How the federal agency will accomplish this is unknown at this time.

According to the Nuclear Regulatory Commission, five currently operating nuclear plants are storing waste outside the plant in temporary, concrete facilities and applications for similar storage units are pending from six more plants.

Transporting Nuclear Waste

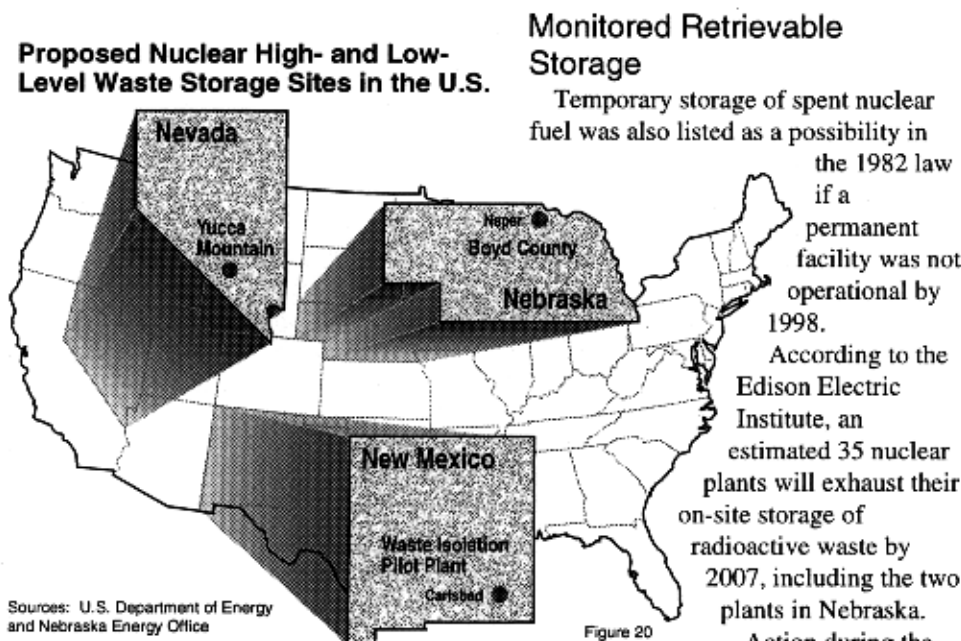
Whether high-level waste is civilian or military, it must be moved from where it was produced to temporary or permanent storage sites. Because many nuclear facilities are east of Nebraska and likely storage areas are west of the state, rail lines and highways in Nebraska are probable corridors for shipments of radioactive waste. One nuclear group estimated that 15,000 truck or rail shipments would be needed over the next 30 years to move the waste from generators to storage sites. As many as 12,000 of those shipments could pass through Nebraska. According to the Nebraska State Patrol, currently only one or two shipments a month pass through the state.

Permanent Low-Level Waste Storage

Nebraska belongs to one of nine regional or state compacts in the nation formed to develop storage facilities for low-level radioactive waste. Low-level waste is generally composed of clothing, filters, resins, tools and other items from nuclear power plants and hospitals. According to the U.S. Department of Energy, utilities generate more than 50 percent of the low-level waste. In Nebraska, it is estimated that utilities generate 90 percent of the low-level waste. Low-level waste remains radioactive for 90 days to 200 years, according to experts.

Boyd County Radioactive Waste Storage Facility and Related Issues

Since Boyd County, Nebraska, was selected in 1988 by its regional compact, the Central Interstate Low-Level Radioactive Waste Commission, and the



reporting period on this type of storage focused on not one, but three storage options: a government-operated facility, a private one operated by utilities and actions being taken individually by utilities that have exhausted on-site storage options.

Two Native American tribes, the Mescalero Apaches in New Mexico and the Skull Valley Band of Goshutes in Utah have shown the most interest in developing temporary storage of nuclear wastes that is government-operated. According to the nation's nuclear waste negotiator, assessments of two possible sites at the Goshute reservation are being conducted. The Mescalero Apaches have shown greater interest in developing a private storage facility.

developer, U.S. Ecology, the building of a low-level radioactive waste facility has progressed along a predetermined number of stages. The facility is now estimated to cost \$151 million, more than five times the original estimate of \$30 million. The facility, if built, is expected to be operational in 1999. As of December 1995, \$80 million had been spent on siting and licensing issues. In 1995, the state estimated that the storage costs at the Boyd County facility would average \$550 a cubic foot, \$230 more a cubic foot than the utilities are now paying.

Until a regional facility is operational, the two Nebraska utilities store waste on site or send the waste to a facility in Barnwell, South Carolina. The South Carolina facility was briefly closed in 1995, but reopened in mid-1996 and is expected to remain open for seven or eight years.

In November 1995, the Central Interstate Compact asked the state to reduce the amount of time allowed for public hearings on the proposed site, thus saving \$6 million. The state and other members of the Compact continued to disagree on the schedule for the license review throughout the reporting period.

The state's Department of Environmental Quality has indicated that its final review of the application to build a site in Boyd County should be completed by February 1998.

Other Highlights

- 1996 brought the tenth anniversary of the nuclear accident at Chernobyl in the Ukraine. Fifty tons of radioactive material was spread by the winds across Russia, Ukraine and Belarus. Today, 25 percent of Belarus' land is uninhabitable. The Ukraine has agreed to close the remaining nuclear plants at Chernobyl under certain conditions.
- The nation's first processing plant for nuclear waste generated from the production of bombs opened in Aiken, South Carolina in 1996. The \$2 billion plant will process radioactive sludge and other wastes and combine it with glass to produce

waste encased logs. It is expected the 35 million gallons of waste will take more than 30 years to process. Initially, the logs will be stored on-site in South Carolina, but are destined to be stored at the permanent nuclear repository.

Natural Gas

State Production and Consumption

After peaking in 1973 at more than 230 trillion British thermal units, Nebraska's natural gas consumption has plummeted by nearly half to 134.1 trillion British thermal units in 1995. The 7.3 percent rise in natural gas use over 1994 was due primarily to weather.

Natural gas expenditures in the state totaled more than \$507 million in 1995, still below the peak of \$567 million in 1984, and an increase of 1.4 percent from 1994.

A small amount of natural gas is mined in the state — less than two percent of that used in a year. A production surge that began in 1993, peaked in 1994 and declined in 1995. Natural gas production totaled 2.2 billion cubic feet in 1995, a decline of 24.2 percent from the nearly 2.9 billion cubic feet produced in 1994.

The all-time production low in Nebraska was in 1991 when 784 million cubic feet were mined. All the state's production is confined to five counties in the Panhandle as shown in figure 21. More than three-quarters of all natural gas production in 1995 came from Cheyenne County. Without any new natural gas field discoveries, the state's production levels should gradually decline over time. Given those prospects, nearly 100 percent of the state's natural gas needs in the future will come from imports.

National Trends

Two natural gas trends, reported in previous *Annual Reports*, continued: the spreading impacts of industry deregulation as a result of Federal Energy Regulatory Commission Order 636 and consolidation of the industry at all levels.

Order 636 fundamentally changed the natural gas utility industry. Securing supplies of natural gas became the responsibility of local utilities, with pipelines reverting to a common carrier status. The effect of the "unbundling" of services forced utilities to deal with every leg of the fuel's travel, from well-head to the customer's door. In the past, utilities relied on a regulated system to guarantee an adequate supply for their

Nebraska Natural Gas Production by County, 1995

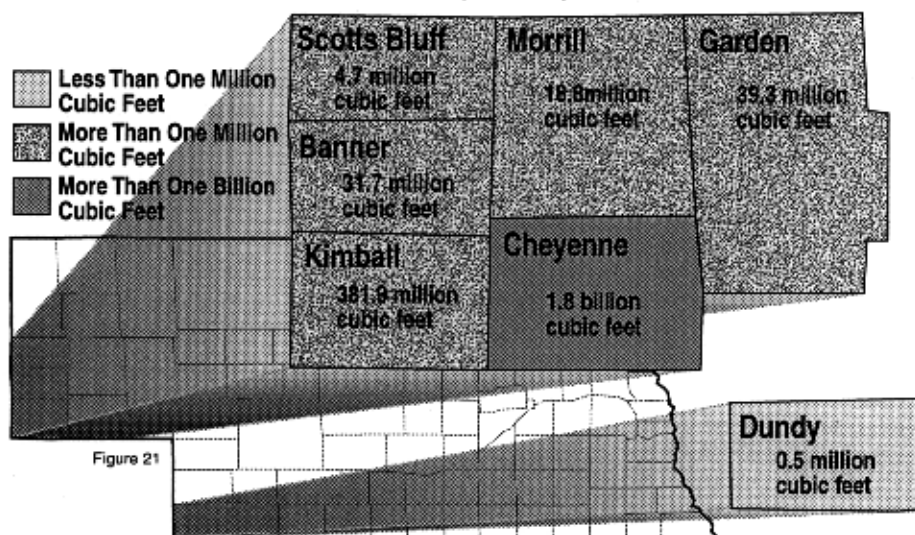


Figure 21

Source: Nebraska Oil Activity Summary; Nebraska Oil and Gas Conservation Commission; Sidney, Nebraska: Annual

customers. With the regulatory safety nets stripped away, utilities must purchase the right amount of gas for the right customers. The new system will also cause a shift in costs according to the *Wall Street Journal*. Individual homeowners and small businesses will pay more, while big industrial customers will be able to negotiate for lower costs.

In the spring of 1996, KN Energy, which provides retail natural gas service to the western two-thirds of the state, began providing smaller gas users such as homeowners in Wyoming a choice of gas suppliers. The utility indicated that it may begin offering similar choices to some Nebraskans in late 1996 or 1997.

State Trends

The ramifications of Federal Energy Regulatory Commission Order 636 continued to resonate throughout the state, primarily for larger natural gas users. The state's largest users of natural gas have always been able to secure the gas they need from sources other than local providers.

Now, customer groups such as motels, restaurants or schools are finding that by using a third party to secure natural gas supplies, they can save from five to 17 percent on their natural gas bills. For the first time, these smaller commercial operations are reaping the benefits that previously only larger firms could realize.

Even a number of smaller cities — Auburn, Fairbury and Wahoo — have become a "customer group" capable of supplying natural gas to larger users within their jurisdictions. This form of service is called "aggregation."

The merger trend also involved a natural gas utility providing service to Nebraskans. Utilicorp, doing business as Peoples Natural Gas Company, attempted to acquire Kansas City Power and Light Company. However, the merger was foiled by a rival, Western Resources.

Other Highlights

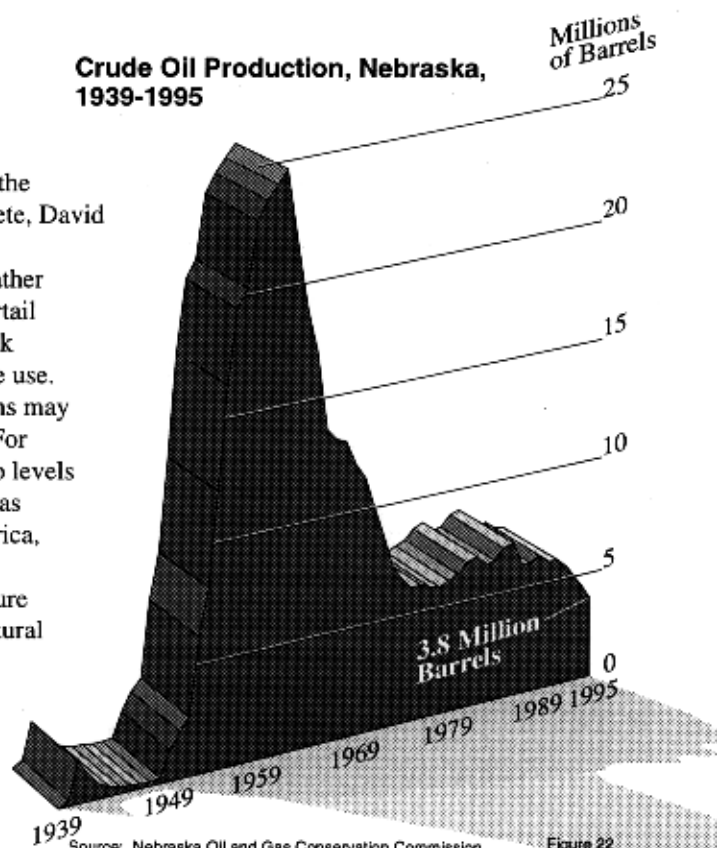
- Because public ownership of utilities is very common in the state, it is not unusual for several towns a year to consider municipalization of utilities. The towns that reviewed the feasibility of municipalization of natural gas service during the reporting period were: Auburn, Broken Bow, Crete, David City, Fairbury, Plattsmouth and Wahoo.
- In January and February 1996, severe winter weather across the state forced natural gas suppliers to curtail services to larger industrial customers, utilize peak shaving facilities and urge all customers to reduce use.
- If natural gas prices parallel oil prices, Nebraskans may be in for a period of natural gas price volatility. For example, in December 1995, natural gas soared to levels not seen since 1993. And because winter 1995 was significantly colder than normal in much of America, gas prices did not retrench in the summer as they normally do. Low inventories and wild temperature swings throughout the nation kept demand for natural gas at higher than normal levels, exacerbating the price volatility.

Petroleum

State Production and Consumption

Oil production in 1995 in the state dropped for the sixth consecutive year. The 3.79 million barrels pumped represented a ten percent drop from 1994 and a new modern-day low. Based on a 1995 price of \$17.23 per barrel, the value of the state's oil production in 1995 was \$65.3 million. The value rose 12.1 percent in 1995 because of a 21.1 percent increase in the price of a barrel of oil. Figure 22 illustrates the state's oil production history since 1939.

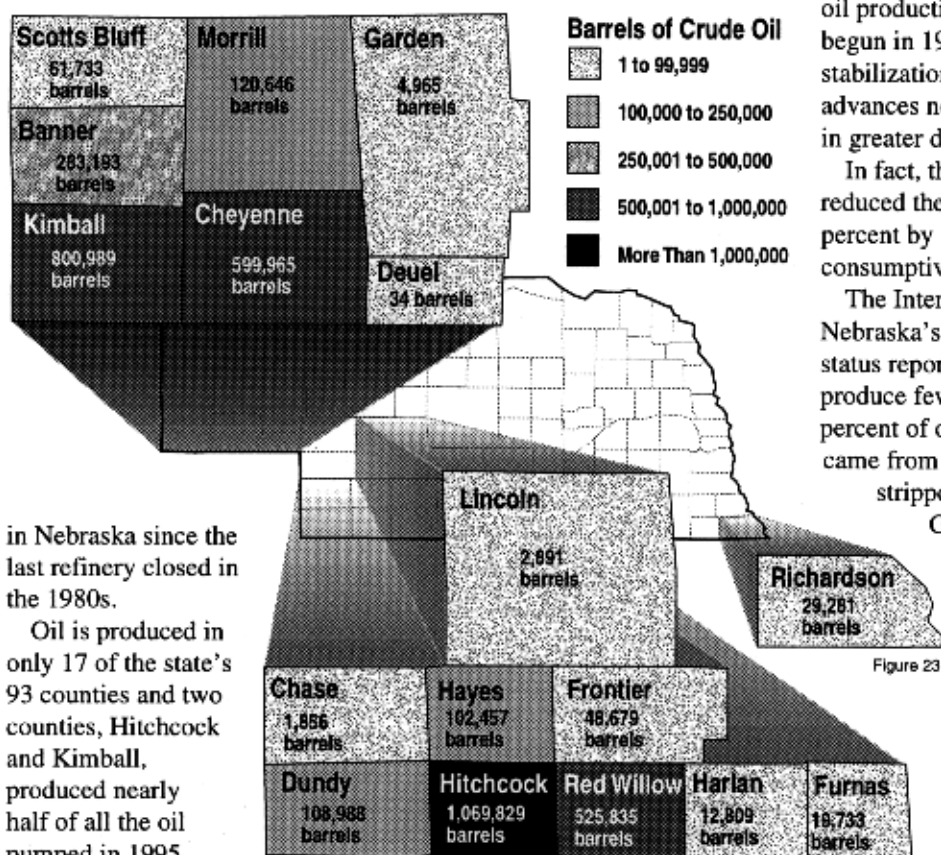
The last time oil production was this low, 1952, the state's first oil well was just a teenager. Only 1,800 barrels were pumped in 1939, the year of the first oil strike in the state. By 1952, production had risen to 2.68 million barrels. None of the oil mined in the state has been refined



Source: Nebraska Oil and Gas Conservation Commission

Figure 22

Nebraska Crude Oil Production by County, 1995



Source: Nebraska Oil Activity Summary, Nebraska Oil and Gas Conservation Commission, Sidney, Nebraska, Annual

Total 1995 Crude Oil Production 3,793,883 Barrels

demand set in 1994, to about 47 percent in 1995. While oil production in the nation continues the long decline begun in 1954, it has generally stabilized. This stabilization, in part, has come from the technological advances now being used in older fields and is addressed in greater detail in "Other Highlights."

In fact, the conservation gains made in the 1970s that reduced the nation's reliance on imported oil from 45 to 32 percent by 1985 have been wiped out by the return to consumptive energy habits.

The Interstate Oil and Gas Compact Commission, which Nebraska's Governor Nelson headed in 1996, released a status report on the nation's stripper wells. Stripper wells produce fewer than ten barrels of oil a day. Eighteen percent of oil production in the continental U.S. in 1995 came from stripper wells. The decline in production from stripper wells is primarily due to well abandonment.

Generally, when the cost of production exceeds the value of the oil, the well is capped and the resource is lost.

In 1994, the American Petroleum Institute predicted that oil imports would rise between eight and nine percent annually, oil consumption would gradually increase and domestic production would decline not-so-gradually.

Other equally sobering trends are also appearing:

- In March 1996, petroleum product inventories had reached their lowest point since 1973 and were down to a

64-day supply. Low product inventories can lead to very dramatic price swings as evidenced in 1995 and 1996.

One of the biggest causes of price volatility is a change in production methods by the nation's refiners. Most refiners are using a "just-in-time" production strategy to maximize profits and avoid losses. With this approach, crude refined product inventories are kept very low. Under this approach, any production or international incident or change in the weather can cause rapid price run-ups. For example, the protracted Iraqi oil export negotiations caused price spikes throughout the year.

- The introduction of reformulated gasoline for use in the nation's nine smoggiest cities as well as other regions that chose to use the fuel voluntarily, caused gasoline to rise to \$1.21 a gallon in July 1995, a ten-year high. More about prices can be found in the Annual Report's "Top Story."
- Excess or idle capacity that could be operational within 90 days declined by 1.6 million barrels a day to just 3.4 million barrels between 1990 and 1996. Virtually all excess capacity is located in Persian Gulf-producing countries.
- Throughout the reporting period, America and the United Nations continued negotiating with Iraq regarding allowing that nation to resume exporting oil. Before the Persian Gulf war, Iraq annually pumped half a million barrels of oil daily.
- While U.S. dependence on imported oil is increasing, more of the oil is coming from non-Persian Gulf countries such as Venezuela and Mexico than during the oil price shock of the 1970s. However, the world's dependence on Persian Gulf oil is increasing, from 37 to 40 percent in the last six years.

in Nebraska since the last refinery closed in the 1980s.

Oil is produced in only 17 of the state's 93 counties and two counties, Hitchcock and Kimball, produced nearly half of all the oil pumped in 1995. Figure 23 indicates the oil-producing counties in Nebraska.

It appears that even the use of advanced oil recovery technology, where practical, will not reverse the state's oil production decline.

An estimated 38.3 million barrels of oil were consumed in the state in 1995, down 2.3 percent from the year before. Less than ten percent of the oil used was produced in the state. As a result, more and more of the state's petroleum needs are being met by other states and countries.

National Trends

The state's oil dependence is increasingly being paralleled by the nation. According to the Energy Information Administration, oil imports into the United States declined from the all-time record of 50.4 percent of domestic

- One troublesome aspect of the continued increase in oil imports is what the cost of those imports does to the nation's balance of trade. Increasingly, as the cost of a barrel of oil has risen, as much as half of the nation's trade balance is attributable to imported oil. On a sustained basis, this continued trade hemorrhage undermines the nation's economic prosperity.
- Some oil experts had predicted that increasing production by non-Organization of Petroleum Exporting Countries such as Norway would serve to keep crude oil prices low. However, that wasn't the case during the reporting period. In early 1996, a barrel of West Texas intermediate crude oil sold for around \$18 a barrel. By April, that same barrel of oil was selling for \$25.
- Despite massive transfers of wealth from the world's developed nations to oil-producing countries in the Persian Gulf, the economies of Gulf-region states are increasingly unstable. The vast societal and infrastructure programs begun in the 1970s are, in some cases, becoming unsustainable. This instability is also leading to economic stress in some countries. For example, Saudis have seen an annual government stipend dwindle from \$14,000 a year to just \$4,000. For the first time, the Saudis are charging for water use. The governments throughout the region are consistently spending more than they earn from the sale of oil, year in and year out. To this is added the destabilizing element of religious fundamentalism that pervades the Gulf region and beyond.
- Americans, in the foreseeable future, should expect a U.S. military force to be permanently stationed in the Gulf region. By mid-1996, the minimum level of American personnel and military hardware in the region totaled 20,000 troops, 200 planes, 150 tanks and naval air carriers — a total of 50 ships. Currently, nearly one-fifth — more than \$50 billion — of the nation's defense budget is spent on defense of the Persian Gulf.

State Trends

In addition to the state's production and consumption patterns identified earlier in this section, Nebraska also reached a low point in new wells drilled — only 60 new holes were drilled in 1995.

Other Highlights

- In 1995, Congress approved the export of oil from Alaska to foreign countries. A prohibition on the sale of oil from Prudhoe Bay had been in effect for 22 years. The U.S. Department of Energy estimates that Alaskan oil supplies about 25 percent of the nation's petroleum needs.

A portion of the law also is designed to dramatically encourage oil and gas exploration in the Gulf of Mexico by eliminating federal royalty payments on the first 17.5 million or more barrels of oil, depending on the depth of the well.

Despite predictions of declining production from the Prudhoe Bay fields in Alaska, employing new technology has forestalled that decline as well as increased the yields. Instead of ceasing production shortly after the turn of the century, oil companies now suggest the fields may be productive until 2030 and an additional 800 million barrels are likely to be produced because of the new technology, the equivalent of a major new find such as the one in the North Sea.

- For the first time, Congress authorized exploratory oil and gas drilling in the Arctic National Wildlife Refuge as part of an omnibus federal budget. However, the federal budget signed by the President did not include the drilling authorization.

A new estimate from the U.S. Geological Survey halved the amount of oil suspected of being in the Arctic Refuge. In updating a six-year old study, the federal agency estimate the amount of oil as ranging from 148 million barrels to 5.15 billion barrels, down from 697 million to 11.66 billion barrels.

"To deplete domestic oil reserves, however, would make little sense in the absence of an energy crisis. It makes more sense for America to conserve domestic supplies and continue buying the relatively low-priced oil from other countries."

"Arctic Refuge...
Should Remain in Protected State"
Editorial, *Omaha World-Herald*
January 1, 1996

- Using technology to arrest falling production in the American oil fields continued during the reporting period. In some cases, 100-year oil fields such as Kern River in California, not only increased daily production by using new technologies, but have been able to increase the amount of oil extracted from an area. Typically, only about half the oil is extracted from an area. Yet, these new technologies such as using steam injection differently, can raise recovery rates to 80 percent.
- Increasingly, the Gulf Coast of America is becoming the area of primary exploratory activity. Technological breakthroughs are allowing drilling at depths previously thought impossible, creating the possibility that oil production from the Gulf of Mexico could surpass Alaska's Prudhoe Bay.

Sites such as Mars, 130 miles from New Orleans, have drilling platforms that are located in nearly 3,000 feet of water. In fact, the oil at the Mars site is much, much deeper — 14,500 feet below the surface. In July 1996, Shell oil announced that an even deeper oil well — at 4,000 feet — would begin production in the Gulf in 1999. Locating deeper and deeper oil well fields is the result of advances in telecommunications and imaging technologies such as satellites, super computers and fiber optic communications cables.

- In early 1996, an estimated 20 million gallons of oil spilled from a tanker onto 120 miles of the Welsh coastline in England. The oil spill exceeded the 1989 Exxon Valdez oil spill in Alaska by nine million gallons. The cleanup costs for the Welsh oil spill were estimated at \$96 million.

Alternate Energy

Efforts to develop clean, abundant and affordable alternates to the use of fossil fuels have been aided by five factors — technological improvements, increasingly stringent environmental laws, federal research funding, utility regulators and broad-based public support.

Because Nebraska is a public power state, utility regulators are not considered a factor in fostering the growth of alternate energy forms in the state. The impact of federal research budget cuts on alternate energy by Congress will, over time, result in slowing technological progress and reductions in the cost of alternate energy.

The five main alternate energy sources — biomass, geothermal, hydropower, solar and wind — are detailed in this section.

State Production and Consumption

In 1995, hydropower supplied an estimated 2.5 percent of the total energy consumed in Nebraska. Biomass, in the form of ethanol, supplied 0.3 percent in 1995. The Energy Office estimates that in 1995, all five forms of alternate energy supplied approximately three percent of the energy used.

While energy production from alternate energy sources is increasing, the increases are generally very small.

National Trends

According to the U.S. Department of Energy in its *Renewable Energy Annual*, seven percent of the nation's total energy needs were met by renewable energy resources in 1994, the most recent year available.

Nearly half of the seven percent came from hydroelectric, followed by biomass (45 percent), geothermal (six percent) and solar and wind (one percent each). The *Report* noted that among non-utility generators of electricity, renewables account for 25 percent of the electricity generated. The *Report* found that wind energy grew the fastest over the past 15 years due to the decline in production costs from 50 cents per kilowatt-hour in 1980 to five to seven cents per kilowatt-hour today. The *Report* also found that the future of renewables in electricity production was uncertain, due in great part to competition and deregulation of the electric utility industry.

A national poll was conducted in 1996 on support for federal research of renewable technologies. The poll found that 56 percent of the respondents wanted federal energy research dollars spent on or tax incentives given for either renewable or energy efficiency technologies. Research funding for fossil and other fuels — natural gas, nuclear and oil — was supported by only 10, 9 and 10 percent, respectively. These findings compared favorably to similar studies conducted in 1994.

The 1996 poll also explored new areas. Eighty-three percent of those surveyed supported tax breaks for renewables and 72 percent either strongly or somewhat supported continuing the tax exemption for ethanol fuels.

State Trends

As indicated above in "State Consumption and Production," alternate energy production and use have remained fairly constant over the years, despite the state's overall growth in energy consumption.

Several legislative bills seeking to advance different types of alternate energy — from wind to biomass — were offered for consideration during the 1995 session of the Unicameral. None of the bills were passed by the senators.

The state's two largest utilities are taking different approaches to the use of alternate energy sources. Nebraska Public Power District, the state's largest, is using tires and the residue left from burned coal — called fly ash — to supplement traditional fuels in generating electricity. The utility is also participating in solar and several wind generation tests. The state's second largest utility, Omaha Public Power District, is currently involved in one of the wind generation studies, but continues to monitor renewable developments closely.

Fuel Source Types

Biomass

While most of the emphasis on biomass energy sources continues to focus on fuels of the future — switchgrass, genetically-engineered trees, garbage and crop wastes — the reality is that, in Nebraska, wood remains the primary alternate biomass fuel in use today, followed by corn used for ethanol production.

Several Nebraska groups are attempting to have the state's utilities generate up to 25 percent of their electricity from biomass sources by 2010.

In northeast Nebraska, several groups continue to examine the feasibility of growing switchgrass to use as feedstock for an ethanol plant.

Geothermal

Geothermal energy use in Nebraska remains limited to small-scale systems such as ground-source heat pumps used in schools, businesses and homes.

Hydropower

Hydropower in the state comes from two sources — 11 hydroelectric dams in or on the border of the state and power supplied to Nebraska by Western Area Power Administration. The power administration transfers hydroelectric power produced in

western states to state agencies, municipalities and public power districts. Taken together, all hydroelectric sources met more than 14.4 percent of the state's electricity needs in 1995. Nationally, about 9.8 percent of the country's electricity needs are met annually through hydropower.

At this time, it is not anticipated that other sources having hydroelectric potential will be developed in the state. It is more likely that hydro resources will decline with time. For example, resolution of the relicensing of Kingsley Dam may result in a reduction in the production of electricity.

Other

One of the more exotic alternate energy forms to surface in 1996 was "crank" technology. With a few twists of a "crank," a radio plays for up to 30 minutes. The South African company manufacturing the radio estimates that \$500-\$1,000 from battery costs will be saved over the radio's three-year lifespan. The company plans on producing a "crank" flashlight next.

Solar

Solar or photovoltaic energy continued to make significant technological gains in 1995-1996, reducing yet again the cost of electricity from this power source. In 1996, two American solar panel producers expanded production facilities and five more plants are scheduled to begin operation in the next three years.

By that time, electricity produced from solar power is expected to cost 12 cents per kilowatt. Currently costs are estimated at 18 cents a kilowatt, down from \$2 a kilowatt in 1976.

The worldwide market for solar is greater outside developed countries, especially where infrastructure is non-existent. An estimated one-third of the world's population currently lives without electricity. In 1995, solar power worldwide grew 18 percent and is expected to grow annually by 20 percent through 2000, according to industry sources. The United States produces one-third of the world's solar panels, surpassing all other countries in solar cell production.

Solar Two, a ten megawatt plant in the California desert, became operational in early 1996. Teaming solar panel technology with storage concepts, the plant is capable of producing power when it's needed, not just when the sun is shining. The federal government-electric utility experiment is producing electricity for ten cents a kilowatt and will operate through 1999.

The key to advancing solar technology remains moving from a one-of-a-kind prototype to mass production. When solar cells are mass produced, the cost of production plummets. For example, if the technology used in the California test could be mass produced, it has been estimated that electricity from the solar cells could be produced for 5.5 to 6 cents per kilowatt, including one cent for maintenance. However, this is still above current Nebraska electricity production costs, but well below the national average price of eight cents per kilowatt.

Current, cost-effective use of solar cell technology in Nebraska is primarily limited to the powering of electric fences by cattle producers.

One of the state's rural electric systems, Wheatbelt in Sidney, is continuing to test a solar-powered pump for livestock wells. Remote, sparsely settled areas are where solar power can be cost-effective in today's America. These types of solar units would be far cheaper than rural electric's current alternative — constructing a new power line for \$18,000 per mile, plus operation and maintenance costs.

Wind

As of late 1995, more than 5,000 wind turbine clusters were generating electricity in Iowa, Minnesota, New York and Texas. California, which leads the nation with 15,000

turbines, produces one percent of the electricity it uses from wind.

In Nebraska, two wind studies announced in 1993-1994 continued during this reporting period.

Earlier studies by the Union of Concerned Scientists had estimated that wind resources in the state were sufficient to supply 120 times the amount of electricity currently being used in Nebraska — the equivalent of seven percent of the electricity used in the nation.

The first study is being conducted near Ainsworth by Nebraska Public Power District, KBR Rural Public Power District and Battelle Pacific Northwest Laboratory, part of the U.S. Department of Energy. One of five studies in the nation, Ainsworth was selected because earlier studies found the area to have good potential for wind generation in the summer, when the state's electricity need is greatest and the site is also located close to an existing transmission system — both important factors. Nebraska Public Power District found the results from the first 18 months of monitoring so promising that additional monitoring sites in the area are being installed. The utility has even started working with manufacturers to modify existing wind turbine technology so that it is more suitable for Midwest terrain. The Ainsworth site recorded an average wind speed of 15.8 miles per hour.

The second, and larger study is being undertaken by the Nebraska Power Association and the Energy Office. The \$300,000-plus, three year study first concentrated on sites near Imperial, Kimball, Rushville, Springview, Stuart, Valentine, Wahoo and Winnebago. The results from the first year of monitoring appear in figure 24. According to the study consultants, six of the eight sites — all but Rushville and Wahoo — had potential for wind generation development. The study is scheduled to conclude in 1998.

One cautionary example of the barriers to using wind to generate electricity

surfaced at a legislative hearing in the fall of 1994. A California company told a Scottsbluff landowner who had been monitoring wind speeds on his farm for a year that if he could find a buyer for up to 70 megawatts of electricity at 4.5 cents per kilowatt-hour, the company would build a \$75 million wind farm. Two power providers the landowner contacted would only pay one cent per kilowatt-hour, the avoided cost of running the utility's own power plants. Under federal law, utilities buying power from non-utility providers do not have to pay more than avoided costs.

Average Annual Wind Speed in Miles-per-Hour, Nebraska, 1995

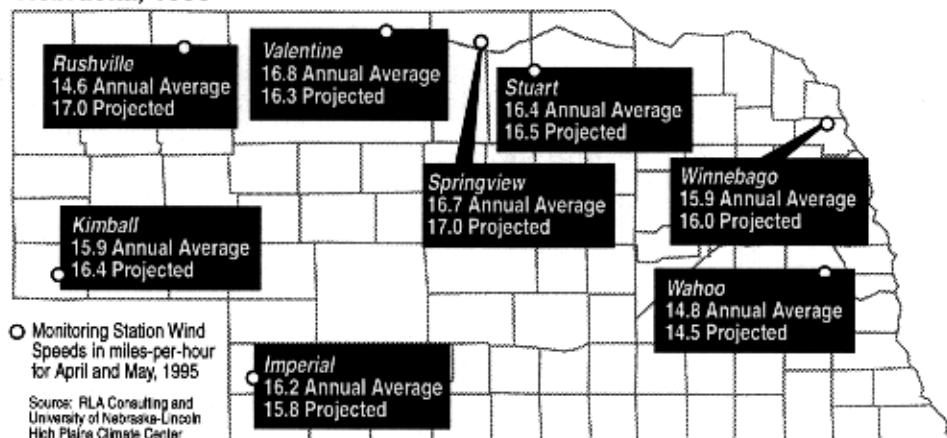


Figure 24

Nebraska Energy Office
1200 N Street, Suite 110
Lincoln, NE